NEW APPLICATION

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L-00000B-21-0393-00197

Application

for a

Certificate of Environmental Compatibility

Coolidge Expansion Project

Prepared for:

State of Arizona Power Plant and Transmission Line Siting Committee and State of Arizona Corporation Commission

Submitted by:

Salt River Project Agricultural Improvement and Power District (SRP)

December 2021

Case No. TBD

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ABBREVIATIONS

2025 General Plan	City of Coolidge 2025 General Plan
ADA	Arizona Department of Agriculture
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AM	amplitude modulation
AMA	Active Management Area
amsl	above mean sea level
APLIC	Avian Power Line Interaction Committee
ARHP	Arizona Register of Historic Places
ASLD	Arizona State Land Department
ASM	Arizona State Museum
BGEPA	Bald and Golden Eagle Protection Act
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BLM	Bureau of Land Management
BMP	best management practice
CAISO	California Independent System Operator Corporation
CAP	Central Arizona Project
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CT	combustion turbine
dB	decibel
dBA	A-weighted decibel
du/ac	dwelling unit(s) per acre
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FERC	Federal Energy Regulatory Commission
FM	frequency modulation
IBA	Important Bird Area
ISO	International Organization for Standardization
KOP	Key Observation Point
kV	kilovolt
lb/mmBtu	pounds per million British thermal units
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
LTCS	long-term storage credit
MBTA	Migratory Bird Treaty Act
NAAQS	national ambient air quality standards
NO_X	nitrogen oxides

NSA	Noise Sensitive Area
PAD	Planned Area Development
PCAQCD	Pinal County Air Quality Control District
PM_{10}	particulate matter with aerodynamic diameter less than 10 micrometers
$PM_{2.5}$	particulate matter with aerodynamic diameter less than 2.5 micrometers
Project	Coolidge Expansion Project
ROW	right-of-way
SGCN	Species of Greatest Conservation Need
SO_2	sulfur dioxide
SR	State Road
SRP	Salt River Project Agricultural Improvement and Power District
SWAP	State Wildlife Action Plan
SWCA	SWCA Environmental Consultants
UPRR	Union Pacific Railroad
USFWS	U.S. Fish and Wildlife Service
WCS	Wildlife Conservation Society
WSAC	wet surface air coolers
WSC	Wildlife Species of Concern

INTRODUCTION

Salt River Project Agricultural Improvement and Power District (SRP or District), under Arizona Revised Statute (A.R.S.) § 40-360 et seq., submits this application (Application) for a Certificate of Environmental Compatibility (CEC) to expand the Coolidge Generating Station, a natural gas–fired, simple-cycle power plant near Coolidge, Arizona, that was built between 2009 and 2011 and purchased by SRP in 2019 to help support growing demand for power in the region.

SRP is a community-based, not-for-profit utility providing water and power to more than 1,000,000 residential, commercial, industrial, agricultural, and mining customers in Arizona. As a community-based public power provider, SRP is focused on providing reliable, sustainable, and affordable power to its customers. To meet that goal, SRP operates or participates in a broad portfolio of generating resources, including nuclear, coal, natural gas, hydroelectric, and renewable facilities. The District is an agricultural improvement district and a political subdivision of the State of Arizona formed in 1937.

During public meetings held on August 24, 2021, and September 13, 2021, the District's publicly elected Board of Directors (Board) considered and approved the Coolidge Expansion Project (CEP or Project), the subject of this Application. The CEP is critical to the overall transition of SRP's power generation resource portfolio. SRP requests a CEC for the construction of up to 820 megawatts (MW) of new capacity and associated transmission infrastructure to interconnect the new generation to the regional transmission system, as shown in Figure 1. The new transmission components include a 500-kilovolt (kV)[1] generation tie line and a new 500kV switchyard to interconnect with the existing Pinal Central to Browning 500kV transmission line.

As required by Arizona Administrative Code R14-3-2 1 9, this Application is structured as follows:

- **Exhibit A – Project Location and Land Use**
- **Exhibit B – Environmental Studies**
- **Exhibit C – Areas of Biological Wealth**
- **Exhibit D – Biological Resources**
- **Exhibit E – Scenic Areas, Historic Sites and Structures, Archaeological Sites**
- **Exhibit F – Recreational Purposes and Aspects**
- **Exhibit G – Concepts of Typical Facilities**
- **Exhibit H – Existing Plans**
- **Exhibit I – Noise Emissions and Communication Interference**
- **Exhibit J – Special Factors**

A list of abbreviations is provided following the Table of Contents.

[1] Nominal 500 kV transmission and generation infrastructure is technically 525 kV. For ease and consistency, this document refers to 525 kV as 500 kV.

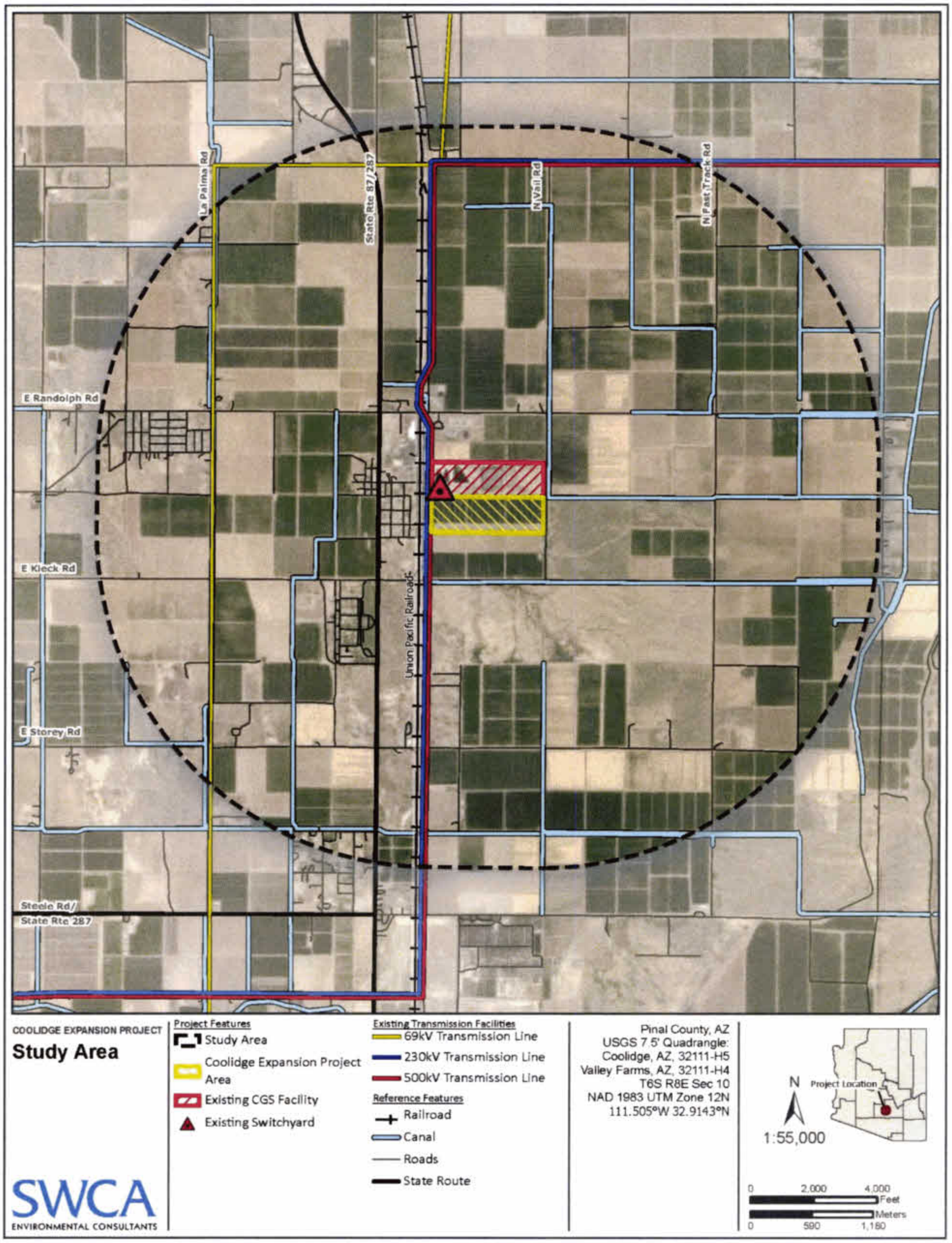

Figure 1. Project Study Area.

Need and Benefit

The CEP will allow SRP to meet the significant near-term capacity needs in its service territory, which is among the fastest growing regions in the nation. While providing critically needed capacity and reliability, the CEP will also facilitate the integration of additional renewable resources. Specific needs and benefits addressed by the CEP include the following:

Meeting Near-Term Peak Capacity Need: One of SRP's primary responsibilities to the communities it serves is to provide reliable electric service. SRP's service territory continues to demonstrate strong economic recovery with a population growth that is more than three times the national average. With the recently announced Intel expansion, new data centers, and other high-profile businesses with significant loads locating in SRP's service territory, SRP's peak demand forecast is growing significantly.

With this unprecedented amount of economic growth, SRP is using a comprehensive strategy that includes improving existing generation fleet operational efficiencies, additional customer demand response programs, purchase of additional interest in Palo Verde Generating Station, and significant amounts of new solar and battery storage. Even with all of those additions, SRP still needs more than 1000MW of additional capacity by 2025.

The CEP will ensure that SRP can meet these significant near-term capacity needs, while maintaining system reliability and staying on the path to achieve SRP's deep decarbonization goals over the long term.

Reliable Integration of Additional Renewable Generation: SRP has committed to add 2,025 MW of solar photovoltaic energy to its renewable portfolio by 2025 to meet its Board-approved goal of a 65% reduction in carbon emissions intensity by 2035. Along with increased solar generation comes greater fluctuations in demand for electricity from SRP's power system and a need for fast-ramping generation to meet that increasingly variable demand. Each combustion turbine at the CEP will be capable of rapid starts (within 10 minutes) and a quickly changing power output to match variable electricity demand. This flexible operating capability serves reliability needs both when the units are generating and when the plant is offline and not burning fuel.

Complementing SRP's Storage Portfolio: Battery storage is an important component of SRP's resource planning strategy. SRP is adding nearly 350 MW of battery storage in 2023, bringing total battery storage capacity on SRP's system to approximately 400 MW, among the highest of any utility in the nation. The addition of flexible natural gas turbines provides a proven technology to complement batteries in serving SRP's near-term additional capacity needs. The addition of gas-fired capacity will allow SRP to focus batteries on maximizing carbon reduction i.e., to discharge renewable resources frequently to match loads rather than holding energy indefinitely for long-duration reliability events.

Supporting SRP's Transmission System: A large portion of the state's generation facilities are interconnected at or near the Palo Verde Hub west of Phoenix. The CEP location will better balance generation in the East Valley with the generation located in the West Valley and will optimize the overall transfer capability, reliability, and flexibility of SRP's transmission system. The CEP is also favorably situated to provide voltage support and improve Valley-wide load serving capabilities.

Leveraging Existing Infrastructure: The CEP will utilize an existing generation site that has land available to construct the needed facilities. Further, the Project will leverage other existing infrastructure at the site, including the gas pipeline, transmission network, and wells, which will minimize the need for new infrastructure in the general area and reduce the cost of the CEP.

SRP's Evaluation of Options to Meet Need

When SRP considers investing in a new power generation resource, it carefully considers alternatives in the context of reliability, SRP's 2035 Sustainability Goals, and affordability for its customers. In evaluating options for the CEP, SRP evaluated a broad range of generation technology options, including whether it could build a portfolio of zero-carbon resources that could achieve the same reliability as the Coolidge plant expansion. In addition, SRP evaluated different sensitivities, including higher natural gas prices and lower battery costs than current forecasts suggest.

As a result of the variability of renewables like solar and wind, and the limited duration of current battery storage technology, SRP would need to build three to four times the megawatt capacity of zero-carbon resources (primarily solar and batteries) to achieve similar reliability as the Coolidge expansion. SRP is an early adopter of battery technology and has already committed to adding 350 MW by 2023—among the highest of any utility in the West. SRP anticipates adding more battery storage projects in the coming months and years as the technology matures.

However, SRP does have significant concerns about adding the amount of battery storage that would be required to achieve similar reliability as the CEP, especially in the timeframe required. Neither SRP nor the utility industry as a whole have much operational experience with batteries, particularly long-term operating experience. The United States has only approximately 3,200 MW of energy storage—1,300 MW of that began operation this year, with the other 1,900 MW operating less than 3 years.[2] To put this into context, that 1,900 MW represents 0.2% of the United States' total electricity generation capacity. For these reasons, SRP determined that adding battery storage over the next 3 years in the amounts to achieve similar reliability as Coolidge expansion was impractical and costly. Increasing battery storage at a measured pace, however, allows SRP to gain experience as the technology evolves and realize the benefits of both decreases in battery prices and increases in storage duration that we expect to occur.

In addition to providing assurances of reliability, the Coolidge portfolio was the lower-cost option in all scenarios and did not impact SRPs ability to meet or exceed Board-established carbon reduction commitments. The CEP is not just the most prudent and practical decision but also is the best economic decision that provides the most value to SRP's customers.

Project Description

The Coolidge Generating Station is an existing natural gas–fired, simple-cycle power plant that supplies power during periods of peak electricity demand. The proposed CEP will add 16 General Electric (GE) combustion turbine generators (CTGs) designed to produce up to 820 MW of net electrical output based upon the optimal coincident ambient air conditions of temperature and relative humidity.

SRP selected the GE LM6000 turbine technology for the CEP based on three factors: reliability, flexibility, and operational experience. The LM6000 turbines are flexible resources that allow SRP to integrate more renewables into the power system. They can start up and change output quickly to support

[2] Acp, "Clean Power Quarterly Report Q3 2021," ACP, October 25, 2021, https://cleanpower.org/resources/clean-power-quarterly-report-q3-2021/.

the variability of renewable resources. In addition, the flexibility of this technology allows us to operate just one or two turbines when needed, versus having to run all of them at the same time The LM6000 model is an industry leader in reliability with over 40 million operating hours and over 99% reliability. In addition, the existing Coolidge Generating Station utilizes the LM6000 technology, providing operational familiarity and common spare parts to reduce maintenance costs.

The CEP will be operated as a peaking facility, and as such, will run to help meet SRP's peak demand at the hottest times of the year, or when needed to smooth out the variability of renewable resources. The CEP also could be called upon in unexpected longer duration events such as outages of other units. The CTGs are capable of rapid start-up, allowing the CEP to respond to fluctuations in electric demand within 10 minutes when offline.

The CTGs will use best available emission control technology to control nitrogen oxides (NOx) and carbon monoxide (CO) emissions. Each CTG is equipped with water injection to the combustors to minimize the production of NOx. In addition, selective catalytic reduction (SCR) systems will further reduce NOx emissions using a combination of catalysts and injection of 19% aqueous ammonia solution. CO emissions will be controlled with the use of oxidation catalyst.

The CEP generation method is a simple cycle, which does not rely on steam to produce power, so it uses significantly less water than other types of generation, such as a combined cycle natural gas power plant. After completion of the expansion, SRP will discontinue the use of groundwater and will rely exclusively on stored Central Arizona Project (CAP) water to serve the Coolidge Generating Station.

To put the CEP water use in context, the statewide water use in 2017 was about 7 million acre-feet. SRP projects the Coolidge Generating Station to use about 450 acre-feet after expansion. This represents less than $1/100^{th}$ of 1% of total water use in the Arizona.

Figure 2 depicts the site layout and arrangement of the existing Coolidge Generating Station and the CEP. The new generation facilities will occupy approximately 30 acres of the 100-acre site.

In addition to the generating facilities, SRP is requesting approval for the transmission line and associated infrastructure needed to interconnect the facility to the existing 500 kV transmission line that runs along the west side of the site. The new infrastructure includes transmission lines and a new 500 kV switchyard. The existing Pinal Central to Browning 500 kV transmission line will be looped in and out of the new 500 kV switchyard resulting in a Pinal Central to new 500 kV switchyard transmission line, and a new 500 kV switchyard to Browning 500 kV transmission line. In addition, four new generator tie lines will traverse from the new generating facilities to the new 500 kV switchyard. All new transmission line infrastructure, including the new switchyard, will be located on land owned by SRP. Figure 2 depicts the transmission-related facilities included in this Application.

Public Outreach Summary

SRP first identified a need for future flexible gas ramping resources like this Project in its 2017–2018 Integrated Resource Plan as part of SRP's strategic resource directions. The decision to move forward with the proposed expansion of the exiting Coolidge Generation Facility was announced in August 2021 as part of its 2021 summer stakeholder process.

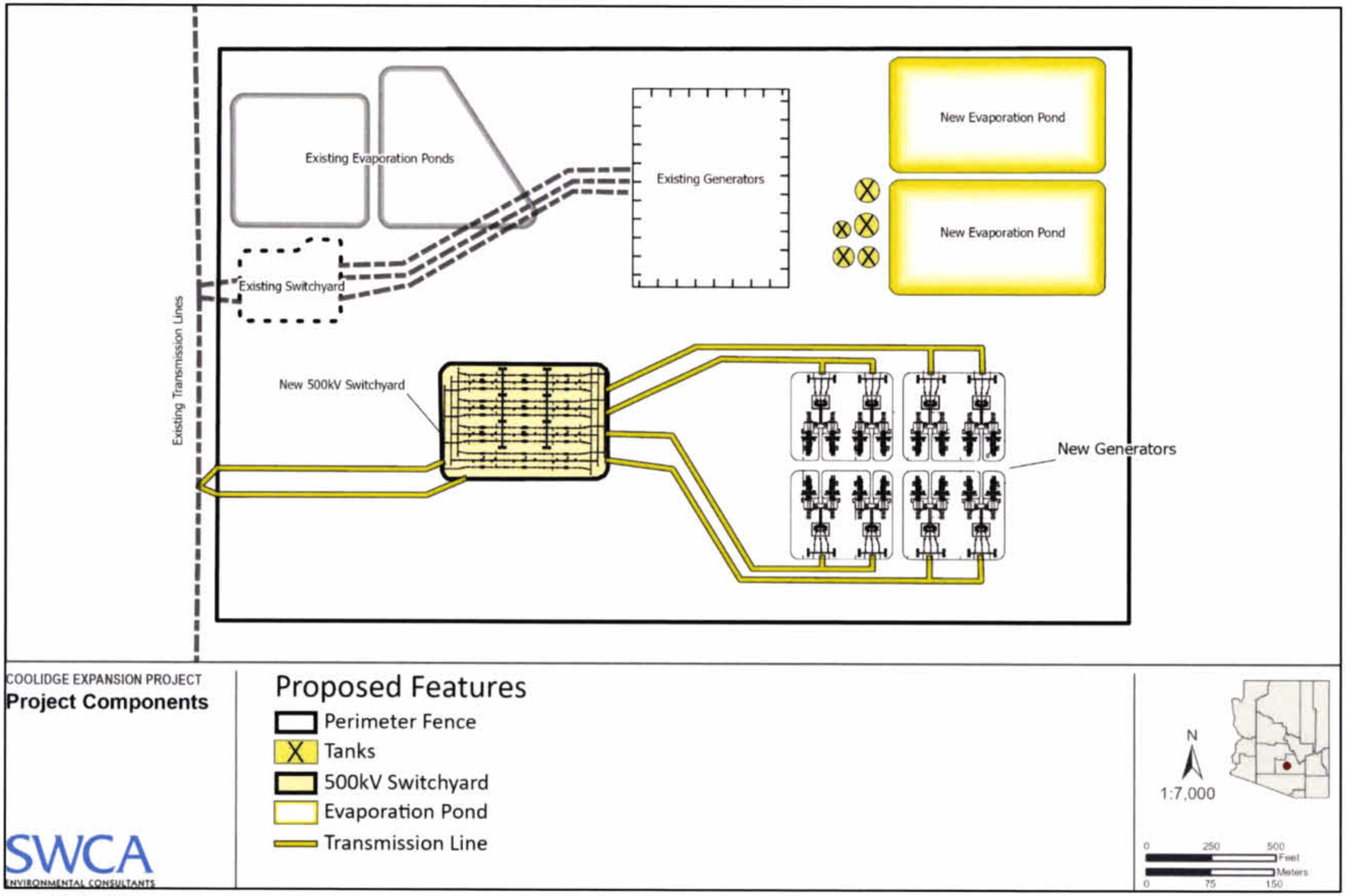

Figure 2. Project components.

Following SRP's Power Committee in August 2021 and subsequently SRP's Board approval of the Project in September 2021, SRP has conducted a robust public outreach and stakeholder engagement process comprised of numerous outreach activities. The outreach process informed the public, public officials representing the region, jurisdictional agencies, key landowners, and stakeholders.

The process included in-person briefings, postcard mailings, social media outreach, a virtual open house, several online and in-person open houses, telephone calls, and emails. The virtual open house has been available on demand 24 hours a day since September 30, 2021. In-person meetings included many briefings with local officials and regional representatives; a public meeting in the community of Randolph on October 16, 2021; and public open houses on November 3, and December 9, 2021. SRP also hosted four live on-line open houses in October.

SRP mailed postcards announcing the Project and providing guidance on how to obtain additional information to landowners within a 7-mile radius of the Project site – over 7,000 mailers in total. SRP sent a second mailing to these landowners informing them of the online and in-person open houses. In addition, SRP used social media to inform the public and stakeholders of the virtual open house, the online live open houses, and the in-person open houses. SRP also advertised the in-person open houses in the *Coolidge Examiner*. Additionally, SRP hosted a toll-free information telephone line and developed a Project website to allow members of the public to obtain information about the Project and provide comments. SRP's public outreach process is described in further detail in Exhibit J.

Summary of Environmental Compatibility

The CEP is located within an area previously planned and zoned by the City of Coolidge for industrial uses. Expanding at an existing site allows access to critical infrastructure including transmission, fuel, and water, eliminating the need to develop or construct new off-site transmission or pipelines reducing environmental impacts.

The following provides a summary of the environmental compatibility of the Project sought in this Application:

- **The Project is consistent with existing plans of this state, local government, and private entities for other developments at or in the vicinity of the proposed site.**
- **No significant or detrimental effects to fish, wildlife, plant life, and associated forms of life upon which they are dependent.**
- **No significant or detrimental effects associated with noise emission levels and interference with communication signals.**
- **Neither SRP nor jurisdictional agencies have any plans for future development of recreational facilities associated with the Project.**
- **Project implementation would be consistent with safety considerations and regulations.**
- **No significant or detrimental effects to existing scenic areas, historic sites and structures, or archaeological sites at or in the vicinity of the Project.**
- **The Project is environmentally compatible with the total environment of the area.**

SRP respectfully requests the Arizona Power Plant and Transmission Line Siting Committee approve, and the Arizona Corporation Commission affirm, the requested CEC for the CEP, which is needed to allow SRP to meet the significant near-term capacity needs in its service territory and provide reliability and fast-ramping power output to facilitate the integration of additional renewable resources.

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APPLICATION FOR CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

1. Name and address of the Applicant

Name: Salt River Project Agricultural Improvement and Power District (SRP)
Address: 1500 North Mill Avenue
Tempe, AZ 85281-1298

2. Name, address, and telephone number of a representative of the applicant who has access to technical knowledge and background information concerning this application, and who will be available to answer questions or furnish additional information

Name: Bill McClellan
Address: PO Box 52025, Phoenix 85072-2025
Telephone: (602) 236-5387
Fax: (602) 236-3407
Email: Bill.McClellan@srpnet.com

3. State each date on which the applicant has filed a ten-year plan in compliance with A.R.S. § 40-360.02 and designate each such filing in which the facilities for which this application is made were described. If they have not been previously described in a ten-year plan, state the reasons therefore.

In accordance with A.R.S. Section 40-360.02, SRP has filed ten-year plans annually with the Arizona Corporation Commission (ACC). Due to its nature as a generation facility, the Coolidge Expansion Project (CEP) is not described in those filings. The CEP is described in a 90-day pre-application plan filed by SRP on September 14, 2021, in the 90-day pre-application plan docket (Docket No. E-00000M-08-0170).

4. Description of the proposed facility, including:

1. ***With respect to an electric generating plant:***

i. Type of generating facilities (nuclear, hydro, fossil-fueled, etc.).

The Coolidge Generating Station is a natural gas fired, simple-cycle power plant that will supply power during periods of peak electricity demand. The CEP is critical for SRP to meet near-term peak capacity and integrate renewables while maintaining electric system reliability.

ii. Number and size of proposed units.

The CEP will include sixteen (16) General Electric (GE) LM6000 PC SPRINT NxGen (GE LM6000) combustion turbine generators (CTG). The CEP will be designed to produce up to 820 megawatts (MW)[3] of net electrical output based upon the optimal coincident ambient air conditions of temperature and relative humidity

[3] *Electrical output from a power generating facility such as the CEP is largely dependent upon three site specific variables; elevation, temperature, and relative humidity. In general, electrical output from this type of facility increases as elevation and temperature decrease, and relative humidity increases. Based upon the mean sea level elevation, and assuming ambient conditions most favorable to electrical output, a maximum nominal output of 820 MW is expected for the CEP.*

(RH). The CTGs are capable of rapid start-up, allowing the CEP to respond to fluctuations in electric demand within ten minutes when offline

The CEP will be designed to operate at output levels ranging from minimum turndown (50%) of a single CTG, through any combination of CTGs, up to all 16 generators in operation using full power augmentation. Therefore, the CEP is expected to supply between approximately 25 and 820 MWs of power output under optimal conditions. However, during hot, dry summer conditions, when the CEP's generation is most likely to be needed, the actual maximum net output is likely to be 10-15% lower.

Site Layout and Arrangement

Figure 4-1 depicts the proposed site layout and arrangement of the Coolidge Generation Station. The layout shows the relative sizes and locations of the proposed equipment and improvements on the Project site, including access roads, the gas meter station, the new 500kV electrical switchyard and connection, and ponds for wastewater discharge and storm water management.

The generation facilities will occupy approximately 30 acres of the 100-acre Site. A network of roads for fire equipment and maintenance access surrounds the generation equipment. The new evaporation ponds in the northeast corner of the site will occupy approximately 16 acres.

Combustion Turbine Equipment

The CEP will utilize the GE LM6000 combustion turbine engines derived from technology used in the aviation industry. Each CTG will utilize power augmentation technology using GE's SPRINT (SPRay INTercooling) system, which enhances the efficiency and output of the LM6000 gas turbine engine

These CTGs will use best available emission control technology to control nitrogen oxides (NOx) and carbon monoxide (CO) emissions. Each CTG is equipped with water injection to the combustors to minimize the production of NOx. In addition, selective catalytic reduction (SCR) systems will further reduce NOx emissions using a combination of catalysts and injection of 19% aqueous ammonia solution. CO emissions are controlled with the use of oxidation catalyst.

iii. The source and type of fuel to be utilized, including a proximate analysis of fossil fuels.

The CEP will be fueled solely by pipeline quality natural gas. Natural gas will be provided by the existing El Paso Natural Gas and TransWestern pipeline systems.

iv. Amount of fuel to be utilized daily, monthly, and yearly.

Coolidge will be operated as a peaking facility, and as such, it will run for a limited number of hours to help meet SRP's peak demand at the hottest times of the year, or when needed to smooth out the variability of renewable resources. The CEP also could be called upon in unexpected longer duration events such as outages of other units. There are many variables that can impact operation of the facility including natural gas prices, system operating conditions, and the amount of renewables on the system, but it is anticipated fuel utilized at full load and ISO conditions will average approximately 7,162 Million British Thermal Units (MMBtu) (HHV) of gas per hour; 114,586 MMBtu per 16-hour day, and 171,878 MMBtu per 24-hour day. Monthly and yearly fuel use will vary based on factors referenced above.

v. ***Type of cooling to be utilized and source of any water to be utilized.***

The CEP is a simple-cycle gas-fired generating facility therefore CEP will have no steam cycle reducing water use intensity. In addition, the CEP will operate as a peaking facility and not operate many hours during the year therefore CEP will utilize a low amount of water.

Type of Cooling

The 16 LM6000 CTGs will be air-cooled and equipped with a mechanical refrigeration closed-loop lube oil cooling system. The closed-loop lube oil cooling will use glycol-based coolant, circulated through a mechanical chiller which cools the glycol and exhausts the heat to the atmosphere. The balance of plant equipment will also be air-cooled.

Water Use Requirements

Water will be used by the CEP for two primary purposes:

- Water will be injected into the CTG combustors to prevent the formation of NOx
- Increasing fuel efficiency and power output of the CTGs:
  - Water will be used in an evaporative system to increase the humidity and reduce the temperature of the inlet air stream into the turbine combustors increasing fuel efficiency and electrical output.
  - Water will also be used in the SPRINT system, which sprays micro-droplets of water into the inter-stage air stream, reducing the air temperature and increasing the mass flow increasing the electrical output of the generators.

At design ambient temperature of 115.5 degrees F and 9.7% relative humidity approximately 1,843 gallons per minute or raw water will be required if all 16 units are operating at full capacity. Based on the anticipated operating profile of the CEP it is expected the facility will use about 250 acre feet/year.

Source of Water

The source of supply will be water from two existing wells on the property. The property has a history of irrigation water use and grandfathered groundwater rights that have been retired for non-irrigation purposes. However, to alleviate concerns about future reliance on groundwater, SRP will rely exclusively on stored CAP water to serve the Coolidge Generating Station after the proposed expansion. SRP has long-term storage credits that have been earned from the underground storage of CAP water at the Hohokam Irrigation and Drainage District Groundwater Savings Facility and will be recovering those long-term storage credits using the two existing wells on the property. The property is located within the Hohokam Irrigation and Drainage

District Groundwater Savings Facility boundaries which allows the wells to recover the water from the location the water was stored.

vi. ***Proposed height of stacks and number of stacks, if any.***

There will be 16 exhaust stacks, one for each of the 16 CTGs. Each of the stacks will be approximately 85 feet in height and between 9 to 12 feet in diameter.

vii. ***Dates for scheduled start-up and firm operation of each unit and date construction must commence in order to meet schedules.***

The first eight (8) units (SRP CEP Unit numbers 13, 14, 15, 16, 25, 26, 27, & 28) are expected to be in firm operation no later than June 01, 2024. The second eight (8) units (SRP CEP Unit numbers 17, 18, 19, 20, 21, 22, 23, & 24) are expected to be in firm operation no later than June 1, 2025.

Start-up activities associated with the first eight (8) units will start with SRP CEP Unit 13 in December 2023/January 2024 and end with activities pertaining to SRP CEP Unit 28 in May 2024. For the second eight (8) units, start-up activities will start with SRP CEP Unit 17 in August/September 2024 and end with activities pertaining to SRP CEP Unit 21 in May 2025.

Construction on the 16-unit site must commence July 2022 to meet the firm operation dates and planned startup schedule.

viii. ***To the extent available, the estimated costs of the proposed facilities and site, stated separately. (If application contains alternative sites, furnish an estimate for each site and a brief description of the reasons for any variations in estimates.)***

The planned expenditures for construction of the CEP are $830 million.

ix. ***Legal description of proposed site. (If application contains alternative sites, list sites in order of applicant's preference with a summary of reasons for such order or preference and any changes such alternative sites would require in the plans reflected in (i) through (viii) hereof.)***

The CEP will be located on an approximately one hundred (100) acre parcel located on the north 1174.8' of the south 2596.47' of Section 10, Township 6 South, Range 8 East, G&SRB&M, lying easterly of and adjacent to the Southern Pacific Railroad right-of-way, excepting therefrom the east 33' for county road right-of-way. The GSU-to-switchyard electrical interconnection, and the switchyard to be constructed by SRP, also will be located wholly within this parcel.

2. ***With respect to a proposed transmission line:***

i. ***Nominal voltage for which the line is designed; description of the proposed structures and switchyards or substations associated therewith; and purpose for constructing said transmission line***

The CEP will tie in the existing 500 kV transmission line that runs along the west side of the site. The CEP will interconnect electrically to a new 500 kV[4] switchyard. The existing Pinal Central to Browning 500 kV transmission line will be looped in and out of the new 500 kV switchyard resulting in a Pinal Central to new 500 kV switchyard transmission line, and a new 500 kV switchyard to Browning 500 kV transmission line.

Nominal voltage

500 kV.

Description of the proposed structures

Either 500 kV single circuit on tubular steel structures or 500kV double circuit on tubular steel structures.

Description of proposed switchyards and substations

The new 500 kV switchyard will be located on private land located in NE ¼, SE ¼, Sec. 10 T. 6 S., R. 8 E. The new 500 kV switchyard will be located on approximately 46 acres and include control house, relaying, communication equipment, buswork, breakers, switching equipment, and other related components. An enclosure such as a chain link fence or a block wall will enclose the new 500 kV switchyard. The new 500 kV switchyard will be positioned on the property such that it could be connected to the existing Randolph 230 kV switchyard.

Purpose for constructing said transmission line

Supports the interconnection of the 500 kV switchyard which is needed to interconnect the generating system to the transmission line.

ii. Description of geographical points between which the transmission line will run, the straight-line distance between such points and the length of the transmission line for each alternative route for which the application is made.

Description of geographical points between which the ***transmission line*** *will run*

There are two components of the transmission line. The first component is located west of the new 500 kV switchyard and is described as the western transmission line component. The second component is located east of the new 500 kV switchyard and is described as the eastern transmission line component.

The western transmission line component is as follows: Two 500 kV transmission lines will cut into the existing Pinal Central to Browning 500 kV transmission line located in the NE ¼, SW ¼, Sec 10, T. 6 S., R. 8.E and will traverse in an easterly direction to its termination point in the new 500 kV switchyard.

The eastern transmission line component is as follows: Four 500 kV transmission lines will traverse from the new 500 kV switchyard to the generating plant.

Straight-line distance between such points

[4] Nominal 500 kV transmission and generation infrastructure is technically 525 kV. For ease and consistency this document refers to 525 kV as 500 kV.

The western transmission line component is comprised of two transmission lines, approximately 1250 feet between the cut-in point of the Pinal Central to Browning transmission line and the new 500 kV switchyard terminating structure.

The eastern transmission line component is comprised of four transmission lines which are approximately 1500', 1100', 1300' and 1700' in length.

Length of the transmission line for each alternative route

No alternative routes have been identified.

iii. Nominal width of right-of-way required, nominal length of spans, maximum height of supporting structures and minimum height of conductor above ground

Nominal width of right-of-way required

A 100 foot right-of-way for each of the four generator tie lines may be required to traverse over existing gas line easement located within NE ¼, SE ¼, Sec. 10 T. 6 S., R. 8 E. All other proposed infrastructure will be located within SRP-owned property.

Nominal length of spans

Maximum nominal span length is anticipated to be 750 feet.

Maximum height of supporting structures

Maximum height of supporting structures is anticipated to be 199'.

Minimum height of conductor above ground:

Minimum height of conductor above ground is anticipated to be 35'.

iv. To the extent available, the estimated costs of proposed transmission line and route, stated separately. (If application contains alternative routes, furnish an estimate for each route and a brief description of the reasons for any variations in such estimates.)

Construction of the 500 kV switchyard and Browning Substation upgrades is forecast to cost about $64 million.

v. Description of proposed route and switchyard locations. (If application contains alternative routes, list routes in order of applicant's preference with a summary of reasons for such order of preference and any changes such alternative routes would require in the plans reflected in (i) through (iv) hereof.)

Switchyard, generating station, transmission line, and four generating tie lines will generally be located within the NE ¼, SE ¼, Sec. 10 T. 6 S., R. 8 E. This land is located within Parcel No. 401-30-001D, 401-30-001J which is owned in fee by the Salt River Project Agricultural Improvement and Power District.

vi. For each alternative route for which application is made, list the ownership percentages of land traversed by the entire route (federal, state, Indian, private, etc.).

Any alternative routing will be within SRP-owned property.

5. ***List the areas of jurisdiction [as defined in A.R.S. § 40-360(1)] affected by each alternative site or route and designate those proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of any of such areas of jurisdiction.***

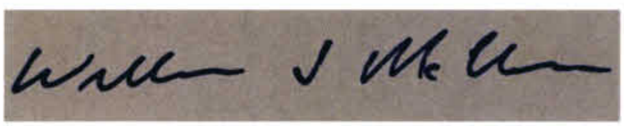
   This section describes the areas of jurisdiction (as defined in ARS §40-360) that would be affected by the CEP Site. The Project is located wholly within the City of Coolidge on private lands within an area that the City has zoned for industrial uses. This zoning designation is consistent with the proposed use for electric generation facilities.

6. ***Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion.***

   The Applicant has evaluated available secondary and field data related to air quality, biological resources, visual resources, cultural resources, recreational resources, land use, noise levels, and communication signals in order to assess the potential impacts that may result from the construction, operation, and maintenance of the Project. These evaluations are included in Exhibits A, B, C, D, E, F, H, and I to this Application.

Based on the information provided above, SRP hereby affirms, upon thorough expert scientific environmental evaluation and analysis, that the Coolidge Expansion Project is environmentally compatible and respectfully requests the Arizona Power Plant and Transmission Line Siting Committee issue a Certificate of Environmental Compatibility (CEC), with a term of 10 years.

By:



William McClellan

ORIGINAL and 25 copies of the foregoing hand delivered and filed with the Director of Utilities, Arizona Corporation Commission, this December 13, 2021.

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EXHIBIT A – PROJECT LOCATION AND LAND USE

In accordance with Arizona Administrative Code Rules of Practice and Procedure R14-3-219, the Applicant provides the following location maps and land use information:

> *Where commercially available,** a topographic map, 1:250,000 scale, showing the proposed plant site and the adjacent area within 20 miles thereof. If application is made for alternative plant sites, all sites may be shown on the same map, if practicable, designated by applicant's order of preference.*
>
> *Where commercially available,** a topographic map, 1:62,500 scale, of the proposed plant site, showing the area within 2 miles thereof. The general land use plan within this area shall be shown on the map, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legendin lieu of an overlay.*
>
> *Where commercially available**, 1) a topographic map, 1:250,000 scale, showing any proposed transmission line route longer than 50 miles and the adjacent area; and 2) a topographic map, a scale of 1:62,500, for routes shorter than 50 miles showing any proposed transmission line route and the adjacent area.*
>
> *Where commercially available, a topographic map,1:62,500 scale, of each proposed transmission line route longer than 50 miles showing that portion of the route within two miles of any subdivided area. The general land use plan within the area shall be shown on a 1:62,500 map required for Exhibit A-3, and for the map required by this Exhibit A-4, which shall also show the areas of jurisdiction affected and any boundaries between such areas of jurisdiction. If the general land use plan is uniform throughout the area depicted, it may be described in the legend in lieu of on an overlay.*
>
> ***If a topographic map is not commercially available, a map of similar scale, which reflects prominent or important physical features of the area in the vicinity of the proposed site or route, shall be substituted.*

Project Location

Figure A-1 illustrates the Coolidge Expansion Project (Project) Site within a 20-mile area at a 1:250,000 scale

Figure A-2 illustrates the land ownership and surface jurisdiction for the location of the proposed Project facilities (Project Area) and land within 2 miles of the Project Area (Study Area) (1:62,500 scale).

Figure A-3 illustrates existing land use within the Study Area (1:62,500 scale).

Figure A-4 illustrates the future land use plans within the Study Area (1:62,500 scale).

The Project is located within the incorporated limits of the City of Coolidge, which is located in Pinal County, Arizona. Figures A-1 and A-2 depict the regional area and, specifically, the location of the Project Area and the municipal jurisdiction boundaries within the Study Area.

Existing land uses within the Study Area include industrial and manufacturing uses, residential development, and mixed uses west of the Project Area, which includes the unincorporated community of Randolph. Other land uses within the Study Area include agricultural lands (both active and abandoned), vacant land, utilities, scattered low-density residential, horse farms, and a private air facility northwest of the Project Area.

Major transportation corridors include the Union Pacific Railroad (UPRR) rail line that runs north–south immediately west and adjacent to the Project Area's western boundary, and State Route (SR) 87 that also runs north–south a short distance west of the UPRR. North Vail Road is a north–south local road located at the eastern edge of the Project Area. The east–west local roads near the Project are Randolph Road, located to the north, and Kleck Road, located to the south.

Inventory

Salt River Project Agricultural Improvement and Power District's (SRP's) consultant completed a land use inventory to identify and map existing and future land uses within the Study Area. Methods for the land use inventory included a desktop analysis, including review of available land use plans, aerial imagery, and other supporting documents, followed by a field inventory of the Study Area. The land use inventory also included outreach and communication with government agencies, municipalities, and other stakeholders within the Study Area to gather information regarding future development plans or known development projects. Specifically, in October 2021, the Applicant sent letters to the relevant jurisdictions and identified land developers to provide Project information and request new or additional information on plans or planned developments within the Study Area. Exhibit H provides a copy of the letter, written responses, and other correspondence from relevant jurisdictions.

Jurisdictions/ Land Ownership

Jurisdictions regulating land use within the vicinity of the Project include the City of Coolidge and Pinal County. The Project is located on private land owned by the Applicant and is located immediately adjacent to the existing Coolidge Generating Station – entirely within the City of Coolidge boundaries. Downtown Coolidge is located approximately four miles north of the Project Site. No state or federal lands border the Project, but both Arizona State Land Department (ASLD) and Bureau of Land Management (BLM) lands are within the Study Area.

The Project is located within an area that the City of Coolidge has zoned for industrial uses. This zoning designation is consistent with the proposed use for electric generation facilities. Land under the jurisdiction of the City of Coolidge is subject to the policies and goals set forth in the *City of Coolidge 2025 General Plan*, adopted June 23, 2014, and *City of Coolidge Zoning Code*, adopted by the Coolidge City Council Ordinance 09-07, effective March 23, 2009 (City of Coolidge 2021).

Pinal County has jurisdiction within the vicinity of the Project south of Kleck Road and west of the UPRR (Figure A-2), including the unincorporated community of Randolph, which is located west of the Project Site between the UPRR and SR 87.

Land Use Plans

Land use information was gathered from the City of Coolidge and Pinal County for the Project Area. The following summarizes the existing and future land uses within the Study Area. This discussion includes the land use designations reflected in the most currently available land use plans from each affected jurisdiction.

City of Coolidge

The City of Coolidge is a municipality located within Pinal County, Arizona, and includes a planning area boundary of approximately 183 square miles. The City of Coolidge is bordered by the Cities of Casa Grande and Eloy to the west and southwest and the Town of Florence to the northeast. According to the City of Coolidge General Plan (City of Coolidge 2009), the City experienced a 52% increase in population between 2000 and 2010. Additionally, census data show that the City experienced a 12% population growth from 2010 to 2020 (U.S. Census Bureau 2010, 2020).

Existing Land Uses

The Project is located within the City of Coolidge. Figure A-3 depicts the existing land uses in the City of Coolidge within the Study Area. The land use categories shown on Figure A-3 have been produced to reflect the actual existing land uses around the Project based on an aerial image review and field verification. The existing land uses on parcels within the City of Coolidge that are near the Project include:

- Industrial
- Agriculture
- Vacant
- Residential–Low Density

Other existing land uses identified within the Project Study Area within the City of Coolidge planning area boundary include Commercial and Air Facility uses.

Planned Future Land Use

The *City of Coolidge 2025 General Plan* (2025 General Plan) is the current planning guide for development within the incorporated and planning area boundaries regulated by the City of Coolidge (Pinal County 2014). The 2025 General Plan provides a compilation of policies, text, graphics, and maps that serves as a guide for how future community development would be managed. The 2025 General Plan designates broad land use categories, which allow a variety of more specific land uses within each broad category. The 2025 General Plan Land Use Plan generalizes these broad land use classifications into six categories: Agriculture, Rural Ranchette, Urban Neighborhood, Downtown Core, Business and Commerce, and Industrial and Manufacturing.

Figure A-4 depicts the planned future land uses in the City of Coolidge within the Project Study Area. The future land uses of parcels administered by the City of Coolidge that are directly adjacent to the Project include 1) Industrial and Manufacturing and 2) Urban Neighborhood.

The future land uses described below are those listed within the 2025 General Plan:

- Industrial and Manufacturing:
    - Single Site Manufacturing, Industrial, and Production Activities
    - Outdoor Assembly, Storage
    - Warehousing and Distribution
    - Rail and Freight-Based Activities
    - Resource Extraction
    - Transportation Related Activities

- Urban Neighborhood:
  - Single Use Retail
  - Service
  - Office Development
  - Neighborhood and Community Retail Development
  - Horizontal and Vertical Mixed-Use Retail/Office/Residential Developments
  - Single-Family Residential
  - Neighborhood and Community Parks
  - Mobile Home and Recreational Vehicle Parks

Additional designated future land uses within the Study Area include Agriculture, Transportation linkages such as the proposed North-South Freeway, Utilities, and Planned Area Developments, or developments that provide a mixture of uses that are designed with places of character.

Pinal County

Pinal County is located within the south-central part of Arizona and has a total area of approximately 5,374 square miles. According to the U.S. Census Bureau data, the 2020 estimated population for Pinal County is 425,264 (U.S. Census Bureau 2020). The City of Coolidge is located within the central portion of Pinal County. As depicted in Figure A-2, portions of the Project Study Area include unincorporated areas under the jurisdiction of Pinal County.

Existing Land Uses

Figure A-3 shows the existing land uses in Pinal County within the Project Study Area. The land use categories shown on Figure A-3 have been produced to reflect the actual existing land uses around the Project within unincorporated Pinal County based on an aerial image review and field verification. The existing land uses of parcels administered by Pinal County within the Study Area of the Project include:

- Agriculture (active and abandoned)
- Commercial
- Residential
- Abandoned Residential
- Public/Quasi Public
- Transportation

Planned Future Land Uses

Land use controls for private land within portions of unincorporated Pinal County are regulated by *We Create our Future: Pinal County Comprehensive Plan* (Pinal County Comprehensive Plan), which strives to create robust and healthy communities, both physically and fiscally by encouraging orderly development (Pinal County 2019).

Figure A-4 illustrates the planned future land uses in Pinal County within the Project Study Area. The future land uses of parcels administered by unincorporated Pinal County that are within the Study Area of the Project include Residential, Transportation, Commercial, and Employment.

These future land uses described below are the land uses listed within the Pinal County Comprehensive Plan:

- Residential densities:
  - Rural Residential
    - Ranchette (0–0.3 dwelling units per acre [du/ac])
    - Rural (0–0.5 du/ac)
    - Very Low Density (0–1.0 du/ac)
  - Suburban Residential
    - Low Density (0–2.0 du/ac)
    - Moderate Low Density (1.0–3.5 du/ac)
    - Medium Density (3.5–8.0 du/ac)
  - Urban Residential
    - High Density (8–24 du/ac)
    - Mixed Use – Residential Focused (8–24 du/ac)
- Transportation:
  - UPRR
  - Local roads
- Commercial – Few operating commercial land uses are present within the Study Area. Most commercial development is present along SR 87, specifically within the community of Randolph. The commercial services present included retail and convenience.
- Employment
  - Areas that can support a variety of employment-generating business activities, such as:
    - Industrial
    - Office
    - Business Park
    - Warehousing and Distribution
    - Power plants are also included in this category

An additional designated future land use within the Study Area identified through outreach and communication with local landowners within the Study Area includes:

- Utilities
  - Solar Energy Development

Potential Effects

Impact Assessment Methodology

Land use impacts may be defined primarily as:

- Project elements that would conflict with the adopted land use or development plans.
- Project elements that would restrict or interfere with existing or future designated land uses within the Study Area, including agricultural, residential, commercial, industrial, transportation, vacant, and open space uses.

Impact Assessment Results

JURISDICTION AND LAND OWNERSHIP

The proposed Project is located within an area currently utilized for agriculture; however, the Project would not result in impacts or changes in jurisdiction or land ownership because the Project is consistent with the City of Coolidge Zoning Code (City of Coolidge 2014) and land use plans.

EXISTING LAND USE

The proposed Project is located adjacent to the existing Coolidge Generating Facility and would expand the existing facility south into the surrounding area. The proposed Project Site, which is owned by the Applicant, is currently utilized as an agricultural field, with the intent to convert this land to an industrial use. Although the Project will change the existing land use, the change is consistent with the future plans of the local jurisdiction. The Project is within an industrial land use area as designated in the 2025 General Plan and would not conflict with the 2025 General Plan or the plans of neighboring jurisdictions.

Construction and future decommissioning activities could temporarily restrict or delay access to areas adjacent to the Project Site. Such restrictions would be temporary and intermittent; no long-term or permanent land use impacts on adjacent areas are anticipated.

FUTURE LAND USE

The future land use designation for the Project Area is Industrial and Manufacturing and is an allowable use consistent with the 2025 General Plan. The Industrial and Manufacturing land use classification supports General Industrial Zone (I-2) zoning within this designation, for which the use of essential public service or utility installations is permitted, indicating the Project is an allowable use and consistent with current zoning. Therefore, no impacts would occur to future land uses or zoning prescriptions at the Project Site. The continued Industrial and Manufacturing land use is anticipated to be compatible with planned future industrial, commercial, and utility development around the Project Area.

Conclusion

The Project would convert existing agricultural land uses to an industrial–electrical generation use, consistent with adjacent existing and planned future land uses based on current plans for the Study Area. There will be no impacts to future land uses because the Project Site aligns with existing adjacent uses, the City of Coolidge's planned land use, and identified future developments in the project vicinity.

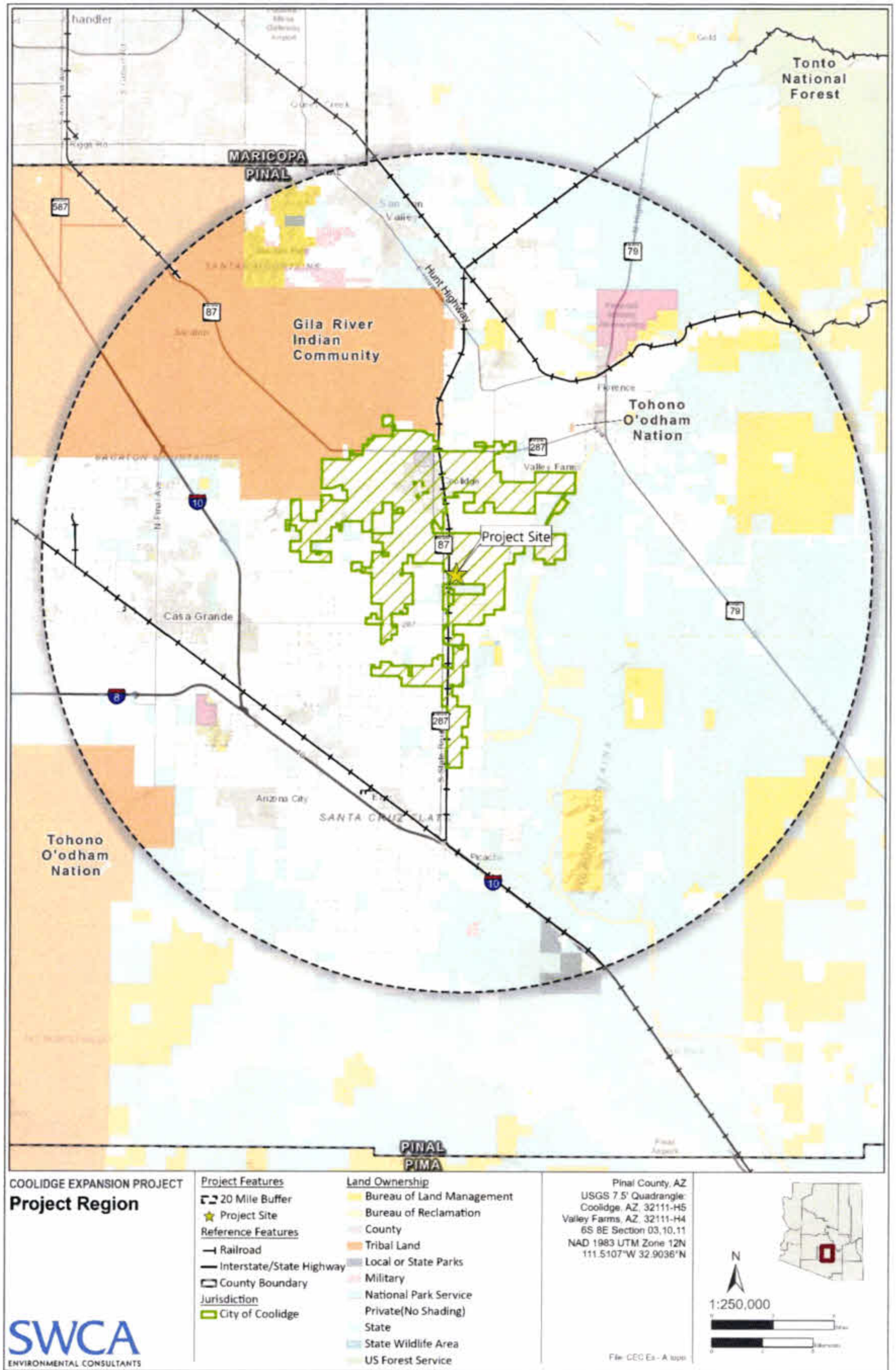

Figure A-1. Project region.

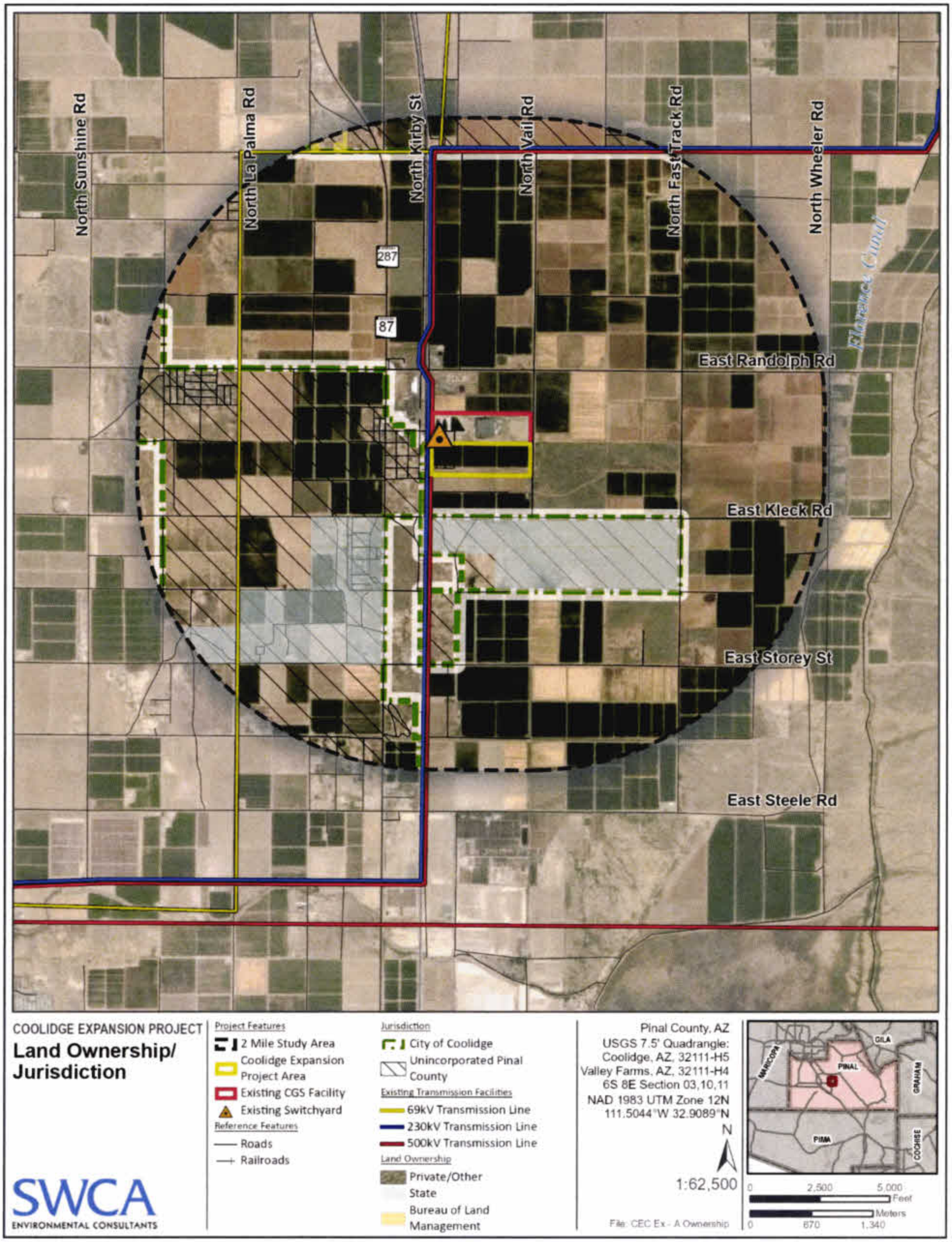

Figure A-2. Land ownership and jurisdiction.

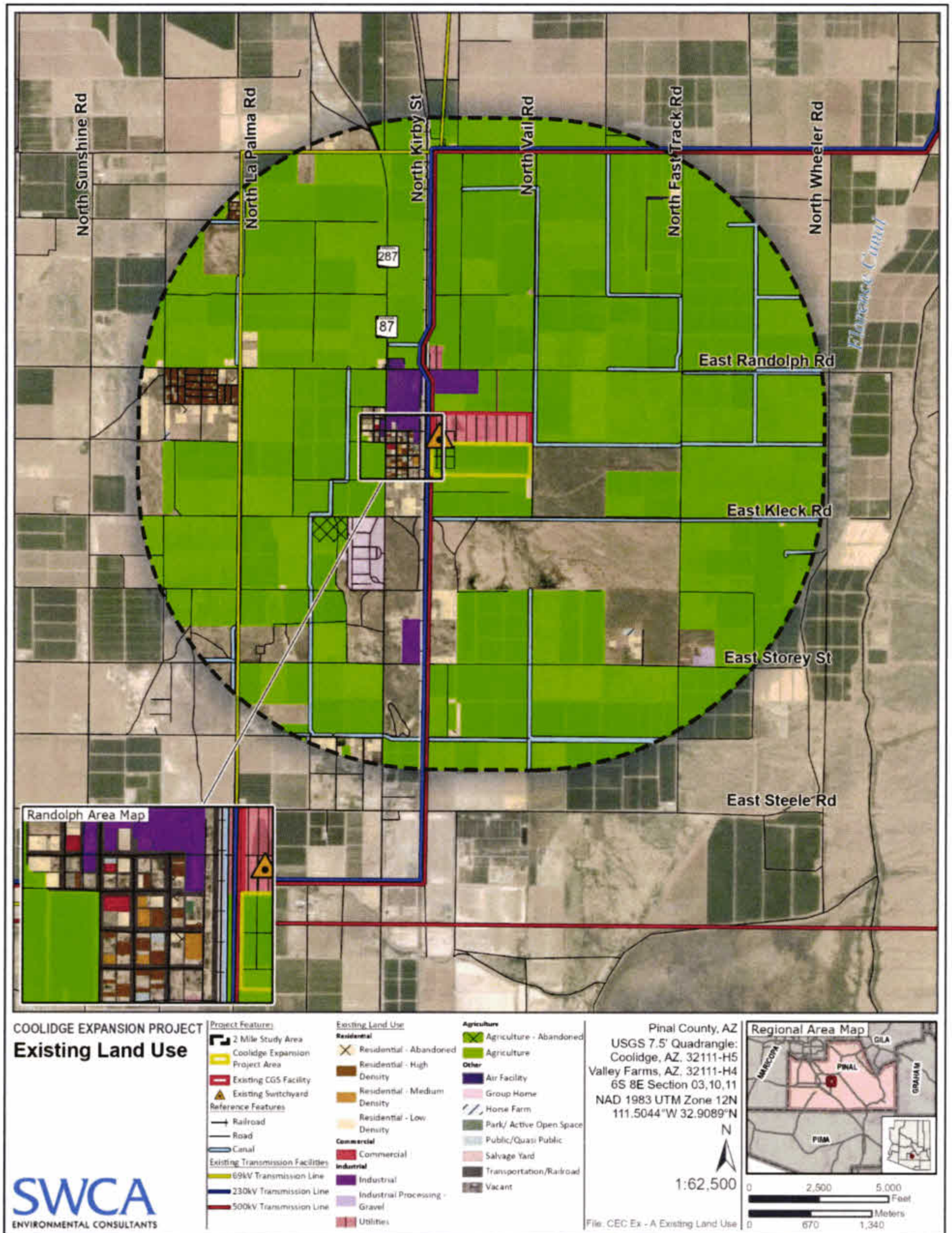

Figure A-3. Existing land use.

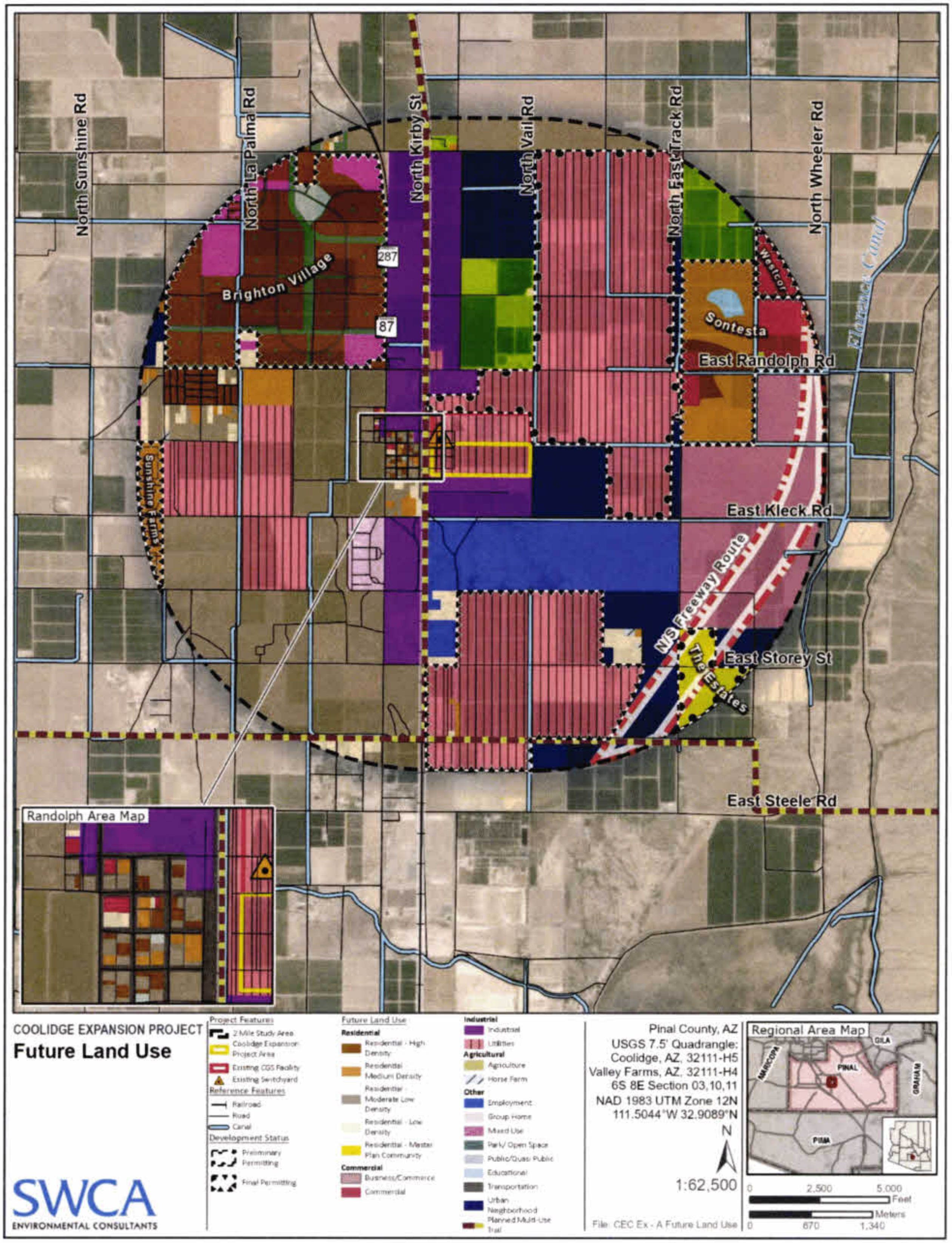

Figure A-4. Future land use.

References

City of Coolidge. 2009. City of Coolidge Zoning Code. Available at: https://www.coolidgeaz.com/vertical/sites/%7BAE188E70-DD7F-47BE-99EF-B58B70641DF9%7D/uploads/Coolidge_Zoning_Code.pdf. Accessed November 2021.

———. 2014. City of Coolidge 2025 General Plan. Available at: https://www.coolidgeaz.com/vertical/sites/%7BAE188E70-DD7F-47BE-99EF-B58B70641DF9%7D/uploads/2-Land_Use_Reduced.pdf. Accessed November 2021.

———. 2021. Overall Zoning Map. Available at: https://www.coolidgeaz.com/vertical/sites/%7BAE188E70-DD7F-47BE-99EF-B58B70641DF9%7D/uploads/Zoning_Map-Overall.pdf. Accessed November 2021.

Pinal County. 2019. *We Create our Future: Pinal County Comprehensive Plan*. Available at: https://www.pinalcountyaz.gov/communitydevelopment/planning/documents/00%20comprehensive%20plan%202015.pdf. Accessed November 2021.

U.S. Census Bureau. 2010. Decennial Census Total Population. Available at: https://data.census.gov/cedsci/. Accessed December 2021.

———. 2020. Decennial Census Total Population. Available at: https://data.census.gov/cedsci/. Accessed December 2021.

EXHIBIT B – ENVIRONMENTAL STUDIES

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

Attach any environmental studies which applicant has made or obtained in connection with the proposed site(s) or route(s). If an environmental report has been prepared for any federal agency or if a federal agency has prepared an environmental statement pursuant to Section 102 of the National Environmental Policy Act, a copy shall be included as a part of this exhibit.

Introduction

The Applicant commissioned environmental studies for the Project, which included an evaluation of land use, biological, visual, cultural, air quality, noise, and recreation resources. The following is an overview of the air quality and groundwater availability studies developed for the Project. The land use, biological, visual, cultural, recreation, and noise resources are discussed in detail in Exhibits A, C, D, E, F, and I, respectively.

Air Quality

The Applicant has applied for an Air Quality Permit Revision from the Pinal County Air Quality Control District (PCAQCD) and has developed an Air Quality Assessment to address the potential impacts of the Project. A summary of the Air Quality Assessment findings follows, and the Air Quality Assessment including the Air Permit Revision Application, modeling report, and construction emission calculations is included as Exhibit B-1.

Baseline Air Quality

The Coolidge Generating Station is an existing electric generating facility that is owned and operated by SRP. The Project will include the installation of 16 aeroderivative GE LM6000PC combustion turbines (CTs) or equivalent natural gas–fired simple-cycle CTs (CT13–CT28) and seven wet surface air coolers (WSACs) (WSAC1–WSAC7) adjacent to the existing Coolidge Generating Station.

The Coolidge Generating Station is in a portion of Pinal County that is designated as being in attainment or unclassifiable for all criteria pollutants except particulate matter with aerodynamic diameter less than 10 micrometers (PM_{10}). The facility is located in the West Pinal PM_{10} nonattainment area, which is classified as serious. The Coolidge Generating Station is currently authorized under a Pinal County Title V Air Permit (Permit V20676.A01), issued on October 1, 2019. SRP submitted a Class I Title V Permit Revision Application to the PCAQCD on August 27, 2021, to authorize the emissions associated with the expanded facility.

Air Quality Impacts During Construction

Construction emissions associated with the Project will result from both on-road and off-road vehicles and equipment, worker commutes, equipment and material deliveries, and fugitive dust. During construction, it is estimated that the worst-case year in terms of emissions could result in 5.88 tons of volatile organic compounds (VOCs), 42.41 tons of CO, 100.59 tons of oxides of nitrogen (NO_X), 3.27 tons of particulate matter (including PM_{10} and $PM_{2.5}$), 3.68 tons of sulfur dioxide (SO_2), and 2,980.38 tons of carbon dioxide (CO_2) on an annual basis. The project will be required to obtain a West Pinal Non-Attainment Area Dust Control Permit. This permit will regulate particulate matter emissions generated due to construction activities. All construction activities will be temporary and transient in nature, with no recurring impacts after construction activities have been completed. Construction emissions compared with emissions from the 2017 Pinal County Emission Inventory are provided in Table 2 of the Coolidge Expansion Air Quality Assessment Technical Memorandum (Exhibit B-1).

Air Quality Impacts During Operation

Emissions due to operational activities will result from the operation of the CTs and WSACs. Estimated operational emissions also include emissions during startup and shutdown. Operations at the Coolidge Generating Station will allow for the plant to emit at a rate that does not exceed the major source threshold for any regulated New Source Review (NSR) pollutant. Annual operational emissions will be restricted to 249.5 tons of VOCs, 249.5 tons of CO, 249.5 tons of NO_X, 249.5 tons of SO_2, and 69.9 tons of particulate matter (including PM_{10} and $PM_{2.5}$). The Class I Title V Air Permit Revision Application is provided in Appendix A of the Coolidge Expansion Air Quality Assessment Technical Memorandum (Exhibit B-1).

Air quality impacts from the Project were assessed by comparing ambient air quality standards and significance levels with the modeled Project ambient air concentrations plus the existing baseline ambient pollutant concentrations in the area of the CEP. The criteria pollutant analysis was conducted to ensure that the Project will not cause or contribute to air pollution in violation of National Ambient Air Quality Standards (NAAQS). Because the Coolidge Generating Station is located in an area of Pinal County that is classified as serious nonattainment for PM_{10}, the modeling analysis demonstrated compliance for both attainment and nonattainment pollutants.

Based on the modeling performed in support of the air permit, the ambient air quality analyses demonstrate the CEP will operate in compliance with the NAAQS. The summary model output is provided in Exhibit B-1.

Greenhouse Gas Emissions

The Project is using the least carbon-intensive fossil fuel source (natural gas). The most prevalent greenhouse gas (GHG) emitted from the Project is CO_2. Maximum emission rates of CO_2 would be limited to a maximum of 120 pounds per million British thermal units (lb/mmBtu) on a 12-month rolling average basis, as required by the New Source Performance Standards (40 Code of Federal Regulations [CFR] Part 60, Subpart TTTT). The maximum emission rate of CO_2 expected to be 116.98 lb/mmBtu.

Conclusion

The air quality assessment demonstrates the Project will operate in compliance with Pinal County, State of Arizona, and federal air quality rules. The Project will not cause or contribute to a violation of the NAAQS, which EPA has established to be protective of human health and the environment.

Water Resources

Introduction

The Project is located in Pinal County within an area designated under Arizona's groundwater regulatory framework as part of the Pinal Active Management Area (Pinal AMA). Established by the 1980 Groundwater Management Code, the Pinal AMA is an area of intense groundwater management within Arizona. The water supply for the project will be 100% derived from the recovery of long-term storage credits (LTSCs) that SRP has acquired within the Pinal AMA. The water associated with the LTSCs will be recovered from wells permitted by the Arizona Department of Water Resources (ADWR) as recovery wells. The hydrologic and regulatory setting of the project, and the effects of the proposed water supply, are summarized below; further detailed information is in the groundwater availability assessment included as Exhibit B-2.

General Hydrologic Setting

Physically, the Eloy groundwater subbasin is characterized by deep alluvial basins with extensive, deep, and productive aquifers. The thickness of alluvial aquifer materials in the subbasin ranges from several hundred feet along the margins of the basin to almost 10,000 feet in the center of the basin. In the vicinity of the Coolidge Expansion project, alluvial sediments are estimated to be about 3,000 feet thick. Well records in the immediate vicinity of the Project confirm that the alluvial sediments near the Project Site are both deep and highly productive.

Groundwater levels near the Project Site follow a typical trend in the Pinal AMA. Groundwater levels in the basin declined steeply until the 1970s before halting and then rising due to reduced groundwater pumping, increased use of Central Arizona Project (CAP) water, and flood recharge from large flood events along the Gila and Santa Cruz Rivers. By 2000, groundwater levels in the vicinity of the project had recovered to 1940s levels, with current depths of roughly 70 to 100 feet below ground surface. In recent years, groundwater levels appear to have started to decline again.

The Pinal AMA generally has groundwater quality that is acceptable for most uses, though there are water quality concerns in the basin including areas of high dissolved solids, nitrates, and fluoride. Drilling at the project site found that overall water quality was acceptable but deteriorated at depths below 400 feet with high levels of dissolved solids, sulfate, and fluoride.

The Pinal AMA also experiences land subsidence due to groundwater pumping. The Eloy subbasin is a known area of subsidence and is actively monitored by the ADWR; recent monitoring indicates subsidence occurring at a rate of approximately 1 centimeter per year. Earth fissures associated with subsidence can also develop, but no earth fissures have been identified within the near vicinity of the Project, with the nearest earth fissures roughly 3 to 4 miles eastward, near the margin of the basin.

Future Projects for the Pinal Active Management Area

The results of recent modeling effort by ADWR for the Pinal AMA were published in 2019, generally raising concerns about future groundwater supplies. The modeling report focused on whether all committed or projected water supplies could physically be obtained from the aquifer and found that, of the roughly 80 million acre-feet projected to be required by the year 2115, only 72 million acre-feet were physically available, suggesting that the Pinal AMA may experience a long-term shortfall of 8 million acre-feet. These shortcomings could be further exacerbated by the ongoing and future drought reductions implemented on the Colorado River, which has directly impacted CAP water delivered to agricultural users in the Pinal AMA.

The critical shortfalls are predicted to occur south of Eloy, roughly 15 to 20 miles from the Project Area. The modeling indicates that groundwater would remain physically available in the Project Area, with likely 500 to 600 feet of saturated aquifer thickness remaining in 2115. In addition, the life expectancy for the Project is significantly shorter than the 100-year modeling time frame.

Effects of the Proposed Water Supply

By recovering LTSCs, the proposed water supply results in a reduction of overall groundwater use in the Pinal AMA. To obtain LTSCs, groundwater is either physically recharged into the aquifer, or surface water is delivered to an entity so that the entity does not have to pump groundwater under an existing groundwater right. In this case, the long-term storage credits were obtained by delivering CAP water to the Hohokam Irrigation District Groundwater Savings Facility. From a water accounting perspective, this mechanism is equivalent to using the CAP water directly at the Project Site rather than using groundwater. In addition, the act of recharging the water through a groundwater savings facility results in a 5% addition to the aquifer that is not subsequently recovered.

Furthermore, the Project would be considered a general industrial user under ADWR's Pinal AMA Fourth Management Plan and would have to comply with the general conservation requirements outlined in the Industrial Conservation Program (§ 6-602), which include avoiding waste by only using the amount of water that is reasonably required for industrial use.

While the groundwater being used is considered to be water recovered from a groundwater savings facility, it must still be physically available at the point of recovery. Based on the latest modeling conducted by ADWR for the Pinal AMA, though groundwater levels are anticipated to decline throughout the basin and at the Project Site, groundwater is anticipated to remain physically available at the immediate Project location through at least 2115. One ramification of falling water levels is that water quality may substantially deteriorate as wells are deepened to access poor-quality groundwater below current well depths of 600 feet. This could require treatment prior to use or could reduce the available cycles before blowdown.

EXHIBIT B-1 – AIR QUALITY ASSESSMENT

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TECHNICAL MEMORANDUM

To: William McClellan, Spence Wilhelm, and Joseph Gardner, Salt River Project

From: Daniel Hampton, Air Quality Specialist, and Brad Sohm, Senior Air Quality Specialist

Date: November 24, 2021

Re: **Coolidge Expansion Air Quality Assessment / SWCA Project No. 00065028-000-PHX**

PURPOSE OF TECHNICAL MEMORANDUM

The purpose of this technical memorandum is to summarize the air quality impacts of the Coolidge Expansion Project (CEP). The following sections describe the existing climate and air quality conditions in the area of the project, the expected construction and operational air emissions, and the potential impacts to air quality that would result from those operational emissions on the ambient air quality in Pinal County, Arizona.

PROJECT INFORMATION

The Coolidge Generating Station is an existing electric generating facility that is owned and operated by Salt River Project (SRP). The facility is in the south-central part of Arizona approximately halfway between Phoenix and Tucson in Pinal County within the City of Coolidge at 859 East Randolph Road. The facility currently consists of 12 simple-cycle combustion turbines (CTs) (General Electric [GE] LM6000PC) and ancillary equipment that produce approximately 575 megawatts (MW) of electrical gross output at ISO conditions at project elevation.

SRP proposes to expand the existing Coolidge Generating Station through the installation of equipment and facilities within the existing power plant boundary (95 acres) and the parcel directly to the south of the existing power plant (approximately 100 acres). The Coolidge Expansion project will include the installation of 16 natural gas–fired simple-cycle CTs (CT13 through CT28). In addition, 7 wet surface air coolers (WSACs) (WSAC1 through WSAC7) are being included as a potential future phase. The Coolidge Expansion project will involve installation of GE LM6000PC CTs or equivalent that will generate approximately 820 MW of additional nameplate electrical output (ISO conditions at sea level).

This project will enable the integration of additional renewable generation while maintaining electric system reliability. SRP expects to add 2,025 MW of solar photovoltaic energy to its renewable portfolio by 2025 to meet its Board approved goal of a 65% reduction in carbon emissions intensity by 2035. Along with increased solar generation comes greater fluctuations in demand for electricity from SRP's power system and a need for fast-ramping generation to meet that increasingly variable demand. Each combustion turbine at the CEP will be capable of rapid starts (within 10 minutes) and quickly changing power output to match variable electricity demand. This flexible operating capability serves reliability needs both when the units are generating and when the plant is offline and not burning fuel.

This memorandum summarizes the air quality impacts that would result from the expansion of the existing Coolidge Generating Station, It describes the existing climate and air quality conditions in the area, the expected air emissions from the existing Coolidge Generating Station and CEP, and the potential impacts that would result from those emissions as predicted by refined air quality modeling.

Additional details are included in the air permit application and supporting refined air quality modeling that has been submitted for the CEP with the Pinal County Air Quality Control District (PCAQCD). Please refer to the air permit application attached as Appendix A and the refined air quality modeling report attached as Appendix B for detailed tables, figures, and supporting information.

EXISTING CLIMATE AND AIR QUALITY

Temperature and Precipitation

The Coolidge Expansion project is located at the southern end of the City of Coolidge in Pinal County, Arizona. The general area is predominantly arid desert characterized by very hot temperatures, large daily temperature range, and sparse precipitation. The mean annual temperature is 70° Fahrenheit (F) with average maximum temperatures ranging from 66 to 106°F and average minimum temperatures from 36 to 76°F. Average annual precipitation is only 9 inches. Most of the precipitation occurs during the winter from December through March and during the monsoonal months of July and August (U.S. Climate Data 2021).

Wind

National Climatic Data Center surface data set (see Appendix B) from Phoenix Sky Harbor International Airport (Weather-Bureau-Army-Navy [WBAN] 23183) in Arizona and upper air data from Tucson (WBAN 23160) in Arizona were used to perform the AERMOD dispersion modeling to support the air permit application for the expansion. Five full years of data between the years of 2014 and 2018 were obtained for the surface and upper air data. A wind rose for the surface station is presented in the attached modeling report (Appendix B). A wind rose is a graphical depiction of the frequency of occurrence of wind direction and wind speed. For the 5-year average, the data shows a predominant wind flow from the east and southeast and a secondary wind flow from the west.

Baseline Air Quality

The Coolidge Generating Station is in a portion of Pinal County that is designated as being in attainment or unclassifiable for all criteria pollutants except particulate matter with aerodynamic diameter less than 10 micrometers (PM_{10}). The facility is located in the West Pinal PM_{10} nonattainment area, which is classified as serious. The most significant air pollutants in Pinal County are PM_{10} and particulate matter with aerodynamic diameter less than 2.5 micrometers ($PM_{2.5}$), which are caused primarily by agricultural activities and naturally occurring windblown dust due to arid conditions.

Ambient background values of air quality data representative of the project area for the years of 2018 and 2020 are included in Table 1 below. These stations were selected as those closest to the CEP for the respective pollutants. This table also presents the relevant National Ambient Air Quality Standards (NAAQS) for each pollutant and averaging period. The locations of the monitoring stations are shown in the modeling report (Appendix B).

Emissions

In Pinal County, air quality is managed by the PCAQCD. Criteria pollutants that are regulated by the PCAQCD include the following:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Sulfur dioxide (SO_2)
- Particulate matter (PM_{10}/$PM_{2.5}$)
- Ozone
- Lead

Table 1 includes the National Ambient Air Quality Standards, the ambient background values for the project area, as well as the monitor locations used to obtain background values.

Table 1. Ambient Background Values (2018–2020)

Pollutant	Average	Background Value* ($\mu g/m^3$)**	NAAQS ($\mu g/m^3$)	Design Concentration	Monitor Name	Site ID
NO_2	Annual	15.5 (8.2 ppb)	100 (53 ppb)	Maximum of annual average from 3 years	Tucson	04-019-1028
	1-hour	26.3 (14.1 ppb)	188 (100 ppb)	Recently recommended Arizona Department of Environmental Quality (ADEQ) value	Alamo Lake	Alamo Lake
CO	1-hour	1040 (0.91 ppm)	40,000 (35 ppm)	Highest concentration from past 3 years	Tucson	04-019-1028
	8-hour	812 (0.71 ppm)	10,000 (9 ppm)	Highest concentration from past 3 years		
Ozone	8-hour	137 (0.07 ppm)	137 (0.07 ppm)	Annual fourth highest daily max 8-hour average from 3 years	Casa Grande	04-021-3003
$PM_{2.5}$	Annual	7.19	12	Three-year annual average	Casa Grande	04-021-3003
	24-hour	18.2	35	Average of the 98% 24-hour values over 3 years		
PM_{10}	24-hour	96.0	150	Three-year average (2017–2019) if second highest values	Coolidge	04-021-3004

*Background values for monitoring sites obtained from the EPA's Interactive Map of Air Quality Monitors (EPA 2021) for all pollutants except NO_2. SRP elected to use the ADEQ-recommended 26.3 $\mu g/m^3$ 1-hour background concentration for Alamo Lake, per the ADEQ Modeling Guidance as updated based on a September 7, 2021, email from PCAQCD to SRP.

**Microgram per cubic meter ($\mu g/m^3$)

Formation of ozone is related to the complex interaction of air pollutants from regional emission sources and regional meteorological conditions. Thus, performing complex cumulative regional emissions and meteorological modeling for ozone for a single project is extremely difficult and is beyond the scope of the analysis required for the air permit. The ozone precursor emissions were evaluated under the EPA's Modeled Emission Rates for Precursors (MERPs) guidance to demonstrate that the project will not result in quantifiable ozone formation. A discussion of this analysis can be found in section 5.7 of the SRP Modeling Report for Class I Title V Air Permit Application (Appendix B). The inherent nature of the combustion of natural gas in CTs does not result in appreciable lead emissions; therefore, lead emissions from the Coolidge Expansion project will be negligible and well below all regulatory thresholds. In addition, emissions of non-criteria pollutants (e.g., asbestos, mercury, fluorides, and hydrogen sulfide) and greenhouse gasses (CO_2, CO_2e) from the Coolidge Expansion project will also be well below all regulatory thresholds. The CTs use state-of-the-art technology to efficiently burn pipeline quality natural gas with reduced Oxides of Nitrogen (NO_x) and CO emissions. Each CT s equipped with water injection to the combustors to reduce flame temperature and minimize the formation of NO_x. The selective catalytic reduction system further reduces NO_x emissions using a combination of catalysts and injection of 19% aqueous ammonia solution, and an oxidation catalyst is used to reduce CO and VOC emissions.

SO_2 and PM_{10} emissions are controlled through the use of pipeline-quality natural gas and good combustion practices. SO2 emissions as presented in the air permit application were based on sulfur content of 0.25 grains per 100 cubic feet.

CRITERIA POLLUTANTS

Construction Phase Emissions

Construction is expected to occur in phases between the years of 2022 and 2025. These phases are expected to include initial sitework and mobilization, material deliveries, earthwork and underground utilities, foundation work, equipment and mechanical work, electrical work, startup/commissioning, operational testing, and final grading/paving. During these construction phases, different equipment will be required on-site that will result in varying emission rates due to construction activities.

Construction activities result in construction equipment tailpipe emissions, light-duty construction vehicle tailpipe emissions associated with worker commutes, delivery truck emissions from deliveries, storage piles, and haul roads. Construction equipment tailpipe emissions were calculated assuming the equipment will operate during daylight hours throughout the duration of the construction phase in which they will be required. Construction activities are expected to occur 6 days per week. Hours of equipment operation used for emission calculations were based on this preliminary work schedule and were adjusted by load factors, which account for typical operating configurations for different types of equipment during construction activities. Light-duty construction vehicle tailpipe emissions were calculated assuming that workers will have on average an approximately 100-mile round-trip commute. Storage pile and haul road emissions were estimated based on similarly sized projects.

To characterize the maximum impacts that will be experienced as a result of construction activities associated with the Coolidge Expansion project, the year that is expected to result in the maximum emission rates based on preliminary construction plans was used. Based on preliminary plans, it is expected that construction activities will occur 6 days per week year round, with activities occurring during daylight hours.

A summary of construction emissions including both criteria pollutant emissions and greenhouse gasses associated with the worst-case emitting year can be found below in Table 2.

As demonstrated in Table 2, construction emissions represent a small fraction of the emission inventory of Pinal County, with NO_x accounting for the highest percentage at 1.02%. All construction activities will be temporary and transient in nature, with no recurring impacts after construction activities have been completed.

Table 2. Worst-Case Construction Emissions

Source	Emissions (tons/yr)					
	Volatile organic compounds (VOC)*	CO	NO_X	PM/ PM_{10}/ $PM_{2.5}$	SO_2	CO_2†
Construction Vehicles and Equipment‡	5.69	39.67	100.40	3.22	3.66	1501.76
On-Road Vehicle Tailpipe Emissions§	0.41	5.47	0.41	0.06	0.04	94.69
Wind Erosion - Storage Piles¶	-	-	-	0.01	-	-
Haul Roads Vehicle Traffic¶	-	-	-	0.02		-
Total	**6.10**	**45.14**	**100.81**	**3.30**	**3.70**	**1,596.45**
Pinal County 2017 Emission Inventory ¥	9,932.47	51,758.91	9,848.96	28,534.81	111.54	3,448,193.51
Construction Emissions Percent of Pinal County 2017 Emission Inventory	0.06%	0.08%	1.02%	0.01%	3.30%	0.09%

*Hydrocarbons were conservatively assumed to be equal to VOCs.

†CO_2 emission factors for gasoline and diesel On-road vehicles were obtained from the Updated Emission Factors of Air Pollutants from Vehicle Operations in GREETTM Using MOVES (Cai et al 2013).

‡Emission factors for construction vehicles and equipment were obtained from the Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling Compression-Ignition (EPA 2010) and are in units of gram per metric horsepower-hour.

§Emission factors for light-duty construction vehicle tailpipe emissions were obtained from Maricopa Association of Governments (2002:Chapter 5) (MAG 2002) and are in units of grams per mile.

¶Storage pile and haul road emission factors were obtained from the Arizona Department of Environmental Quality (ADEQ 2020). No concrete batch plant will be associated with this project.

¥Data obtained from the EPA's 2017 National Emission Inventory for Pinal County (EPA 2017).

Operational Phase Emissions

Emissions from the combustion turbines will be controlled through the use of clean-burning natural gas, good operating combustion practices, selective catalytic reduction to prevent and reduce NO_x emissions, and an oxidation catalyst to reduce CO and VOC emissions. SO_2 and PM_{10} emissions are controlled through the use of pipeline-quality natural gas and good combustion practices.

SRP used the manufacturer's emissions data to estimate Potential to Emit (PTE) of each regulated New Source Review (NSR) pollutant for the proposed combustion turbines. Estimated emissions also include startup and shutdown emissions that have been combined with normal emissions. Particulate matter, NO_X, CO, and VOC emission rates during startup and shutdown, in terms of pounds per event, were provided by GE. Normal emissions are defined as those occurring between generating loads of 50% to 100%. Maximum emission rates for particulate matter ($PM/PM_{10}/PM_{2.5}$), NO_X, CO, and VOC were obtained from GE for the 100% load condition, at site elevation, for 59°F ambient temperature. The SO_2 emission factor is calculated from the maximum natural gas fuel sulfur content. As a part of the Coolidge Expansion project, SRP is considering installing seven WSACs as a potential future phase that will would result in particulate matter emissions ($PM_{10}/PM_{2.5}$). Particulate matter emissions from the WSACs were estimated using site-specific data, planned operating conditions, and manufacturer specifications.

The project emissions for each regulated NSR pollutant are typically calculated by summing PTE for each of the project-affected emissions units. In this case, restricted PTE for the proposed combustion turbines (startup-shutdown and normal operation) and the WSACs is based on the proposed emission limit for each regulated NSR pollutant. As shown in Table 3, the project emissions (based on the PTE) are below the applicable major source thresholds.

Table 3. Comparison of Emissions for Coolidge Expansion Project with Major Source Thresholds

Pollutant	Potential to Emit for Coolidge Expansion Project (TPY*)	Major Source Thresholds (TPY)
PM	69.9	250
PM_{10}	69.9	70
$PM_{2.5}$	69.9	250
SO_2	249.5	250
NO_X	249.5	250
VOC	249.5	250
CO	249.5	250

*Tons per Year (TPY)

The proposed CEP including emissions from the existing site does not result in a new major source for any regulated NSR pollutant.

Per 40 Code of Federal Regulations (CFR) § 52.21 (b)(49)(iv) (implemented per delegation agreement with the EPA), greenhouse gases (GHGs) are potentially subject to regulation only if the existing stationary source or proposed new stationary source is a major stationary source, as that term is defined at 40 CFR § 52.21 (b)(1), based on its PTE for a regulated NSR pollutant other than GHGs. Because neither the existing Coolidge Generating Station nor the proposed physical change is a major stationary source based on its emissions of non-GHG pollutants, GHGs are not considered subject to regulation for Prevention of Significant Deterioration (PSD). The project is estimated to emit 547,569 tons of the carbon dioxide equivalent (CO_2e) on an annual basis. CO_2e allows for pollutants to be evaluated in terms of their potential to contribute to global warming in terms of CO_2.

Hazardous Air Pollutants

The annual emissions of any HAP for the Coolidge Expansion project will be well below 10 tons per year, and the total HAPs emissions will be well below 25 tons per year, qualifying the Coolidge Expansion project as an area source of HAPs. As an area source of HAPs, the Coolidge Generating Station will not be subject to the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) rules under 40 CFR Part 63 Subpart YYYY, the National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines. In addition, the sources at this facility are not included in the source categories listed in Chapter 7, Article 2, Table l of the PCAQCD rules.

REGULATORY APPLICABILITY

The Coolidge Generating Station is currently authorized under a Pinal County Title V Air Permit (Permit #V20676.A01), issued on October 1, 2019. SRP submitted a Class I Significant Title V Permit Revision Application to the PCAQCD on August 27, 2021. The following provides a review of the Pinal County, state, and federal air quality regulations applicable to the CEP.

County/State Regulations

Under Arizona Revised Statutes 49-402, ADEQ has original jurisdiction over "major sources in any county that has not received approval from the administrator for new source review under the clean air act and prevention of significant deterioration under the clean air act". Pinal County's nonattainment new source review standards have not been approved by the EPA, although a delegation agreement between ADEQ and Pinal County exists that allows Pinal County to govern major sources within the boundaries of the county. Because Pinal County is relying on this delegation agreement as opposed to their own nonattainment new source performance standards, ADEQ permitting regulations for major sources in Pinal County apply. Because the Coolidge Generating Station will be a major source according to R18-2-218 of the Arizona Administrative Code (AAC), ADEQ's permitting regulations are applicable for the purposes of the Coolidge Expansion project's permitting.

A summary of other applicable county and state regulations can be found below in Table 4.

Table 4. Potentially Applicable County and State Regulations

Citation	Description	Applicability
AAC R18-2-334	Minor New Source Review	The requirements found in this regulation are applicable to a modification that would increase a source's potential to emit equal to or greater than the permitting exemption threshold. The Coolidge Expansion project will exceed these thresholds for all criteria pollutants except SO_2. As a result, reasonably available control technology (RACT) or an ambient air quality assessment is required.
AAC R18-2-334(C)(1)	Reasonably Available Control Technology (RACT)	The application of RACT is required for each emission unit with PTE greater than or equal to 20% of the permitting exemption threshold for a regulated minor NSR pollutant. SRP is proposing RACT for the Coolidge Expansion project irrespective of emission levels when compared to the exemption threshold. For combustion turbines, SRP is proposing to use good combustion practices and clean fuel to control $PM_{10}/PM_{2.5}$, selective catalytic reduction systems to control NO_X, and an oxidation catalyst to control VOCs and CO. For the WASCs, SRP is proposing to use drift eliminators to control $PM_{10}/PM_{2.5}$.
AAC R18-2-334(C)(2)	Ambient Air Quality Assessment	Though not specifically required, SRP has conducted an ambient air quality assessment to confirm that ambient concentrations resulting from the modification combined with the existing concentration of regulated minor NSR pollutants will not interfere with attainment or maintenance of NAAQS.
Pinal County Code § 5-23-1010	Standards of Performance for Stationary Rotating Machinery	Emission limitations for particulate matters are required under this regulation. SRP will be compliant with all applicable emission limits. Additionally, this regulation sets forth opacity limits in which combustion turbines are not permitted to emit smoke for a period greater than 10 consecutive seconds, which exceeds 40% opacity. SRP will abide by these requirements.
Pinal County Code § 4-2-020	Fugitive Dust Countywide	SRP will comply to West Pinal Non-Attainment Area fugitive dust requirements contained within this regulation. Due to SRP being located in the West Pinal Non-Attainment Area for PM_{10}, a West Pinal Non-Attainment Area Dust Control Permit will be required. SRP will comply with all applicable requirements.

Federal Regulations

A description of potentially applicable federal requirements and a brief discussion of their applicability can be found below in Table 5.

Table 5. Potentially Applicable Federal Regulations

Citation	Description	Applicability
40 CFR Part 60, Subpart A	Standards of Performance for Stationary Combustion Turbines	SRP will comply with the applicable requirements under general provisions of 40 CFR Part 60, Subpart A. These will include notifications, compliance testing, monitoring, recordkeeping, and reporting provisions of the rule.
40 CFR Part 60, Subpart KKKK	Standards of Performance for Stationary Combustion Turbines	This New Source Performance Standard (NSPS) Subpart applies to stationary combustion turbines for which construction, modification, or reconstruction commenced after February 18, 2005. The combustion turbines meet the definition of an affected facility under this standard. As a result, the turbines associated with the Coolidge Expansion project are subject to this NSPS Subpart. SRP will comply with all emission limitations, as well as operating, maintenance, monitoring, and reporting requirements associated with this NSPS Subpart.

Citation	Description	Applicability
40 CFR Part 60, Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	This NSPS Subpart applies to carbon dioxide (CO_2) emissions from certain stationary combustion turbines. The Coolidge Expansion project meets the applicability conditions of this regulation and is subject to this NSPS Subpart. SRP will only burn natural gas to comply with this regulation and will comply with any other applicable regulations associated with it. In addition, the combustion turbines will be subject to a nominal CO_2 limitation of 120 pounds per metric million British thermal units (lb/MMBtu) on a 12-month rolling average basis. SRP will comply with this limitation.
40 CFR Part 72 and Code Chapter 3, Article 6	Acid Rain Program	Because the new simple-cycle combustion turbines fire natural gas and produce electricity for sale, these are affected units under the federal Acid Rain Program. SRP will submit an Acid Rain Permit application to the EPA and provide a copy to the PCAQD.

PREDICTED AMBIENT AIR QUALITY IMPACTS

Air quality impacts from the CEP were assessed by comparing ambient air quality standards and significance levels to the modeled project ambient air concentrations plus the existing baseline ambient pollutant concentrations in the area of the Coolidge Expansion project. The analysis evaluated emissions of each criteria pollutant that triggered minor NSR as defined in R18-2-302 of the AAC. The project will trigger minor NSR for all criteria pollutants except lead and SO_2. The criteria pollutant analysis was conducted to ensure that the proposed project will not cause or contribute to air pollution in violation of NAAQS. Since the SRP Coolidge facility is located in an area of Pinal County that is classified as nonattainment for PM_{10}, the modeling analysis addressed the ADEQ's procedures for modeling demonstrations for both attainment and nonattainment pollutants.

The analysis conforms with the modeling procedures outlined in the EPA's Guideline on Air Quality Models (Guideline), the ADEQ's Air Dispersion Modeling Guidelines for Arizona Air Quality Permits, and associated EPA modeling policy and guidance. The modeling analysis also conforms with the modeling protocol submitted to the PCAQCD on August 24, 2021.

The modeling performed included a load screening analysis to determine the operating conditions that result in the highest modeled impacts, a Significant Impact Analysis to calculate the maximum impacts for each pollutant, and a refined NAAQS analysis to determine compliance with the NAAQS.

The dispersion modeling performed in support of the air permit application considers each of the criteria pollutants regulated by PCAQCD, except for ozone and lead. While lead was not included in the modeling, the emissions are predicted to be less than 0.01 tons per year. Photochemical modeling was not performed for this project, though the project's ozone precursor emissions were evaluated under the EPA's Modeled Emission Rates for Precursors (MERPs) guidance to demonstrate that the project will not result in quantifiable ozone formation. The PCAQCD also regulates hazardous air pollutants (HAPs), and an evaluation of these has been included in this analysis.

MODEL RESULTS

Load Analysis Results

The results of the load analysis can be found in Appendix B. The startup load condition was found to cause the highest impacts for all turbines for all pollutant averaging periods. The emissions and stack parameters associated with this load condition were therefore conservatively used in the remainder of the analysis. The startup emissions were not excluded from the significant impact or 1-hour NO_2 NAAQS demonstration.

Significant Impact Analysis Results

The project resulted in significant impacts for PM_{10}, $PM_{2.5}$, and NO_2 (Table 6). Based upon the results of the significant impacts analysis, a cumulative analysis was conducted to assess compliance with the NAAQS.

Table 6. Significant Impact Analysis Results

Pollutant	Avg Period	Maximum Modeled Impact ($\mu g/m^3$) *	PSD Significant Impact Level ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
NO_2	1-hour	71.3	7.5	25
	Annual	2.25	1.0	1.4
CO	1-hour	116	2,000	NA*
	8-hour	45.8	500	NA*
$PM_{2.5}$	24-hour	4.37	1.2	21.1
	Annual	0.85	0.20	15.9
PM_{10}	24-hour	5.62	5	0.79
SO_2	1-hour	2.40	7.8	NA*
	3-hour	1.49	25	NA*

*Microgram per meter squared ($\mu g/m^3$)

Note: Pollutant impact is less than the SIL.

NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the NO_2, PM_{10}, and $PM_{2.5}$ NAAQS. The adjacent Stinger Welding facility was included in the model, and background concentrations were added to the model results to assess compliance. Evaluation of compliance with the 1-hour NO_2 NAAQS was based on the 98th percentile of the annual distribution of daily maximum 1-hour concentrations. Evaluation of compliance with the 24-hour $PM_{2.5}$ NAAQS was based on the 98th percentile of the annual distribution of maximum 24-hour concentrations. Compliance with the PM_{10} 24-hour standard was based upon the sixth highest value over the 5-year meteorological period. Annual $PM_{2.5}$ NAAQS compliance was evaluated based upon the average of the 5-year modeled annual concentrations. The results of the NAAQS analysis are presented in Table 7.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)*	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Total Concentration Percent of NAAQS
NO_2	1-hour	104	26.3	130	188	69.2%
$PM_{2.5}$	Annual	3.70	15.5	19.2	100	19.2%
	24-hour	3.69	18.2	21.9	35	62.6%
PM_{10}	Annual	1.78	7.19	8.97	12	74.8%
	24-hour	41.1	96.0	137	150	91.3%

*Microgram per meter squared ($\mu g/m^3$)

Based on the modeling results, the total concentrations that includes impacts associated with the project as well as the background concentration were below the NAAQS for all pollutants evaluated. The total concentration percent of NAAQS was lowest for $PM_{2.5}$ under the Annual standard at 19.2%, while PM_{10} under the 24-hour standard was the highest at 91.3%. Summary model output can be found in Appendix B.

GREENHOUSE GAS EMISSIONS

Assuming complete conversion of natural gas (as methane [CH_4]) to CO_2 and water, maximum emission rates of CO_2 would be limited to a maximum of approximately 120 lb/MMBtu on a 12-month rolling average basis. This complies with all applicable regulations provided by 40 CFR §60.5520 and 40 CFR §60.5525. The combustion turbines will comply with this limit, with the maximum emission rate of CO_2 expected to be 116.98 lb/MMBtu, below the 120 lb/MMBtu standard provided by NSPS Subpart TTTT.

As a flexible peaking resource, CEP could displace less responsive, support integration of renewable generation resources, and efficient resources from having to operate to meet peak power demands and/or maintain reserve capacity, thereby potentially reducing net GHG emissions.

CONCLUSION

The air pollutant emissions estimates and ambient air quality analyses presented in this memorandum and the attached air permit application (Appendix A) demonstrate the Coolidge Expansion project will operate in compliance with Pinal County, State of Arizona, and federal air quality rules.

LITERATURE CITED

Arizona Department of Environmental Quality (ADEQ). 2020. General Air Quality Permit for Concrete Batch Plants. Available at: https://static.azdeq.gov/permits/General_CBP_Permit_rev.pdf. Accessed November 4, 2021.

Cai, H., A. Burnham, and M. Wang. 2013. Updated Emission Factors of Air Pollutants from Vehicle Operations in GREETTM Using MOVES. Available at: https://greet.es.anl.gov/publication-vehicles-13. Accessed November 4, 2021.

Maricopa Association of Governments. 2002. 2002 Periodic Ozone Emission Inventory. Available at: https://azmag.gov/portals/0/Documents/ES_2007_8-HourOzonePlan_Appendices-Vol1.pdf. Accessed November 4, 2021.

U.S. Climate Data. 2021. *Climate Coolidge – Arizona*. Available at: https://www.usclimatedata.com/climate/coolidge/arizona/united-states/usca0332. Accessed November 18, 2021.

U.S. Environmental Protection Agency (EPA). 2021. Interactive Map of Air Quality Monitors. Available at: https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors . Accessed November 4, 2021.

———. 2017. 2017 National Emissions Inventory (NEI) Data. Available at: https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data#datas. Accessed October 19, 2021.

———. 2015. Greenhouse Gas and Energy Consumption Rates for On-Road Vehicles: Updates for MOVES 2014. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNUQ.pdf. Accessed October 18, 2021.

———. 2010. Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling Compression-Ignition. July.

APPENDIX A

SRP Class I Title V Air Permit Application

Maria Roberts
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Delivering water and power®

Mr. Mike Sundblom, Director
Pinal County Air Quality Control District
P.O. Box 987
Florence, AZ 85132

August 27, 2021

Re: Class I Significant Permit Revision Application
Title V Permit Number: V26076.A01

Dear Mr. Sundblom,

Salt River Project Agricultural Improvement and Power District (SRP) is submitting the attached Class I significant permit revision application for Title V air quality permit (Permit Number V26076.A01) for the Coolidge Generating Station. With this revision, SRP is proposing to install 16 natural gas-fired simple cycle combustion turbines at Coolidge.

If you have any questions regarding the enclosed protocol, please feel free to contact Kristin Watt at (602) 236-5448.

Sincerely,

Maria Roberts

Maria Roberts
Director, Desert Basin and Coolidge Generating Stations

TITLE V / CLASS I PERMIT REVISION APPLICATION
COMBUSTION TURBINES PROJECT AT
COOLIDGE GENERATING STATION
COOLIDGE, ARIZONA
TITLE V / CLASS I PERMIT NUMBER: V20676.A01

Submitted to:

Pinal County Air Quality Control District
31 N Pinal St Bldg F
PO Box 987
Florence, AZ 85132

Submitted by:

Salt River Project Agricultural Improvement and Power District
1500 N. Mill Ave.P.O. Box 52025 PAB359
Tempe, AZ 85281

August 2021

Table of Contents

1.0 INTRODUCTION

Coolidge Generating Station ("COE") is an existing electric generating facility that is owned and operated by the Salt River Project Agricultural Improvement and Power District ("SRP"). The facility is in the south-central part of Arizona approximately half-way between Phoenix and Tucson in the City of Coolidge at 859 East Randolph Road. The facility consists of twelve (12) simple cycle combustion turbines ("CT") (General Electric ("GE") LM6000PC) and ancillary equipment that produce approximately 575 MW of electricity (SIC code 4911). The facility is operating under the Class I Permit Number V20676.A01 issued on June 29, 2019.

SRP is proposing a project to install sixteen (16) natural gas-fired simple cycle combustion turbines ("CT13" through "CT28") and seven (7) wet surface air coolers ("WSAC1" through "WSAC7") (hereinafter "CT Project" or "Project") at COE. The Project will involve installation of GE LM6000PC combustion turbines or equivalent that will generate approximately 820 MW (combined).[1] In addition, SRP is also requesting changes to some of the permit terms and conditions for the existing units.

COE is in a portion of Pinal County that is designated as attainment or unclassifiable for all criteria pollutants except particulate matter with aerodynamic diameter less than 10 micrometers (PM10). The facility is located in the West Pinal PM10 nonattainment area, which is classified as serious.[2] This facility is currently a "major source" under Arizona Administrative Code (A.A.C.) R18-2-401 for the nonattainment new source review ("NNSR") program, with respect to PM10 only. For the prevention of significant deterioration ("PSD") program, the facility is an existing minor source limited to less than 250 tons per year ("TPY") potential to emit ("PTE") of each regulated NSR pollutant under its Class I Permit. [3] In this application, SRP is first proposing to limit the existing

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[1] GE LM6000PC or its equivalent each with approximately 51.1 MW gross generation capacity at 59 °F ambient temperature at full load at sea level.

[2] 40 CFR § 81.303.

[3] NSR – New Source Review.

CTs to less than 70 TPY of PM10, as a synthetic minor limit for PM10. As a result, the source at which construction is proposed is a minor source for all regulated NSR pollutants. Second, in accordance with R18-2-401(13)(c), SRP is proposing to limit the emissions of each regulated NSR pollutant below the applicable 'major source' threshold for the proposed CT Project. Therefore, the proposed Project will not be subject to review under the NNSR and PSD programs. As explained in subsection 5.1.3, the proposed CT Project requires a Class I Permit significant permit revision under Pinal County Code § 3-2-195. SRP is submitting this permit application to Pinal County Air Quality Control District ("PCAQCD") that addresses the requirements for an application for a Class I Permit revision. Also addressed are New Source Performance Standards ("NSPS") and National Emission Standards for Hazardous Air Pollutants ("NESHAP") requirements that are potentially applicable to the Project.

1.1 Application Organization

The remaining sections of the application are organized as follows:

- **Section 2.0 – Site Information** presents general facility information including name, address, SIC code, permit number, and contact information.
- **Section 3.0 – Project Description** provides a description of the proposed Project scope.
- **Section 4.0 – Project Emissions** presents the methodology used to estimate the Project emissions as well as a summary of results.
- **Section 5.0 – Regulatory Requirements** presents an analysis of air quality permitting requirements and the applicability of federal and Pinal County Code to the Project.
- **Section 6.0 – Permit Terms and Conditions** presents proposed permit terms and conditions to keep the Project below exemption thresholds.
- **Appendix A –Application Forms** contains completed application forms for the Project specific information.
- **Appendix B – Emissions Calculations** contains project emissions calculations.

2.0 SITE IDENTIFYING INFORMATION

Company Name:	Salt River Project Agricultural Improvement and Power District
Company Address:	P.O. Box 52025 PAB359, Phoenix, AZ 85072-2025
Facility Name:	Coolidge Generating Station
Facility Address:	859 East Randolph Road, Coolidge, AZ 85128
Responsible Official:	Maria Roberts, Director, Coolidge Generating Station
Responsible Official Phone:	(602) 236-4328
SIC:	4911 (Electric Services)
Permitting Contact:	Zachary Harbin, Senior Environmental Compliance Engineer (602) 236-5779 zachary.harbin@srpnet.com
Facility Contact:	David Lickteig, Senior Environmental Scientist/Engineer (602) 236-7248 david.lickteig@srpnet.com
Site Class I Permit Number:	V20676.A01
Site Part 70 Permit Date:	June 29, 2019

Figure 2-1 is the aerial map of the area showing the site location for COE.

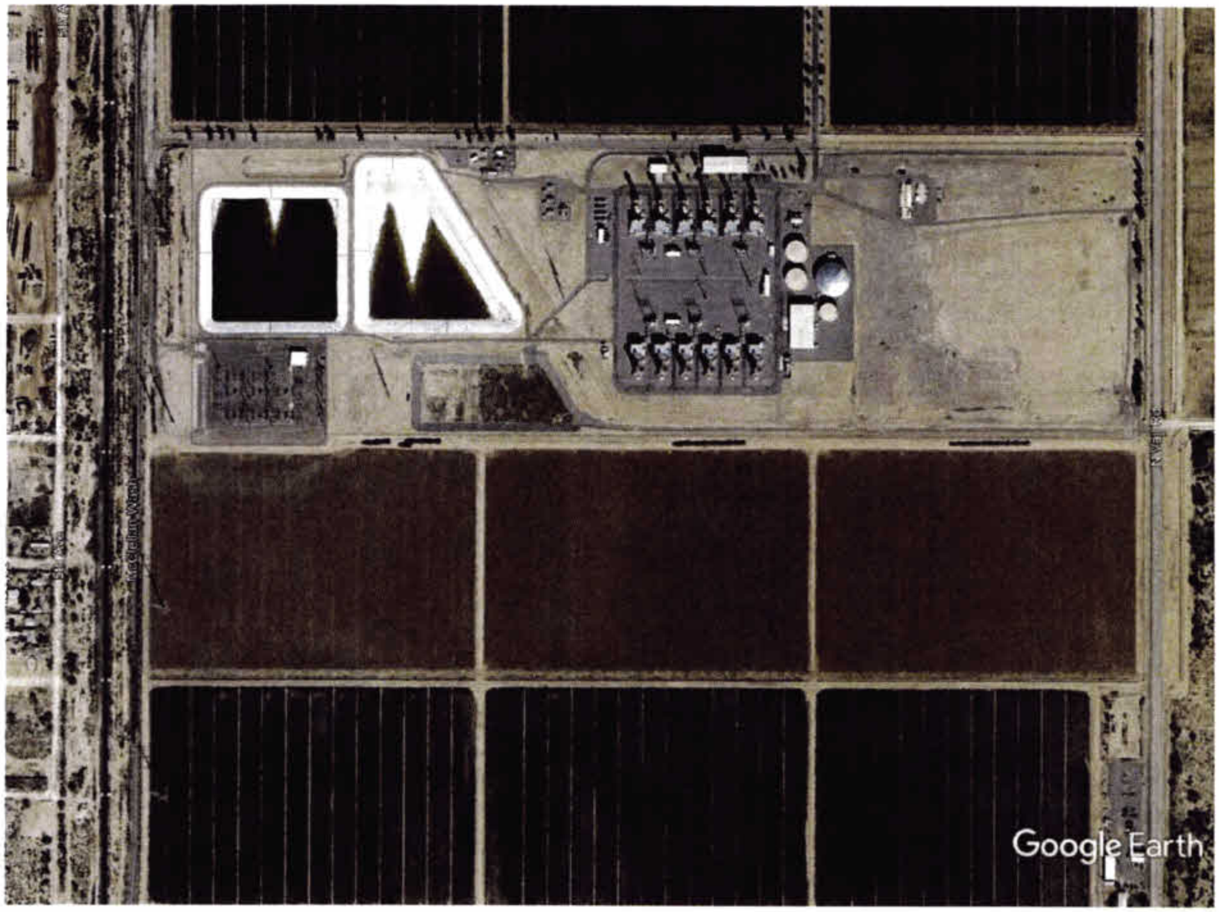

Figure 2-1. Aerial Map of COE Site

3.0 PROJECT DESCRIPTION

SRP is proposing to install ~820 MW generating capacity to provide reliable, immediately dispatchable peaking power. The proposed CT Project involves installation of sixteen (16) natural gas-fired simple cycle combustion turbines to serve peak capacity and allow the integration of renewable resources to the grid. SRP is anticipating the new units to be aero-derivative GE LM6000PC or its equivalent each with approximately 51.1MW gross generation capacity that will generally serve the peak electricity demand.[4]

The proposed CTs will be equipped with inlet chillers to maintain the turbine performance at high ambient temperature. In addition, SRP is proposing to install inlet chillers on the existing CTs. Up to seven (7) wet surface air cooler ("WSAC") units—three to serve the inlet chillers for the existing CTs and four to serve the inlet chillers for the new CTs—will also be installed as part of the project to provide the cooling water for inlet chilling.

3.1 Aeroderivative CTs - General Electric LM6000PC

The aeroderivative GE Model LM6000PC simple cycle combustion turbine will be coupled to an electric generator to produce electric power for supply to the grid. A combustion turbine is an internal combustion system which uses inlet air as a working fluid to produce mechanical power. This combustion turbine technology comprises an air inlet system, two compressor sections, a combustion section, and a turbine section. As the name implies, aeroderivative combustion turbines are based on turbine designs used in the aviation industry. By design this turbine technology is capable of starting and ramping-up to full capacity within 10 minutes. Aeroderivative turbine models are generally specified for use where fast start capability, power demand matching, and relatively lower power outputs are the primary objectives. The air inlet system includes an inlet air heater, inlet air cooler, air filters, and noise silencer that supplies air to the multistage axial compressor. This turbine technology is lightweight, compact, and

[4] MW rating provided by the Manufacturer at sea level at full load.

operates at high compression ratios compared to other turbine technologies. Aeroderivative turbines like those specified for the proposed CT Project operate at a very high compression ratio (typically in excess of 30). The pressure ratio is the ratio of air pressure at the discharge compared to the inlet of the compressor section.

During operation, ambient air is drawn into the compressor section. Once the air is compressed it is heated by the combustion of fuel gas in the combustion section. The combusted gases then expand through the turbine section of the combustion turbine. The pressure differential across the turbine blades caused by this expansion, rotates the shaft of the turbine thus rotating the coupled generator. The rotation of the generator is what produces the power that is supplied to the electrical grid.

Figure 3-1 presents a diagram for the LM6000PC CT. The CT are equipped with inlet air filters which remove dust and particulate matter from the inlet air. During hot weather, the filtered air will also be cooled by passing through an inlet air chiller or evaporative cooling system. During cold weather, the filtered air may be heated by use of a radiative heating system that is part of the anti-icing system. This system utilizes a glycol and water solution as the working fluid that is heated by induction heaters. The filtered air is drawn into the low-pressure compressor section where the air is compressed. The CTs are also equipped with spray intercooling, (SPRINT), which allows for demineralized water to be atomized within the low-pressure compressor. The resulting increase in mass flow allows for higher power output in high ambient conditions. The low-pressure compressor section features fixed inlet guide vanes. The high-pressure section of the compressor uses independently controlled variable stator vanes to optimize air flow to the combustion section. Incorporation of these advanced airflow and cooling technologies help the proposed turbines have lower emission rates, increased fuel efficiency, and minimized unburned hydrocarbon emissions. Water is also injected into the combustion section of the turbine which reduces flame temperatures and thermal formation of nitrogen oxides (NO_x).

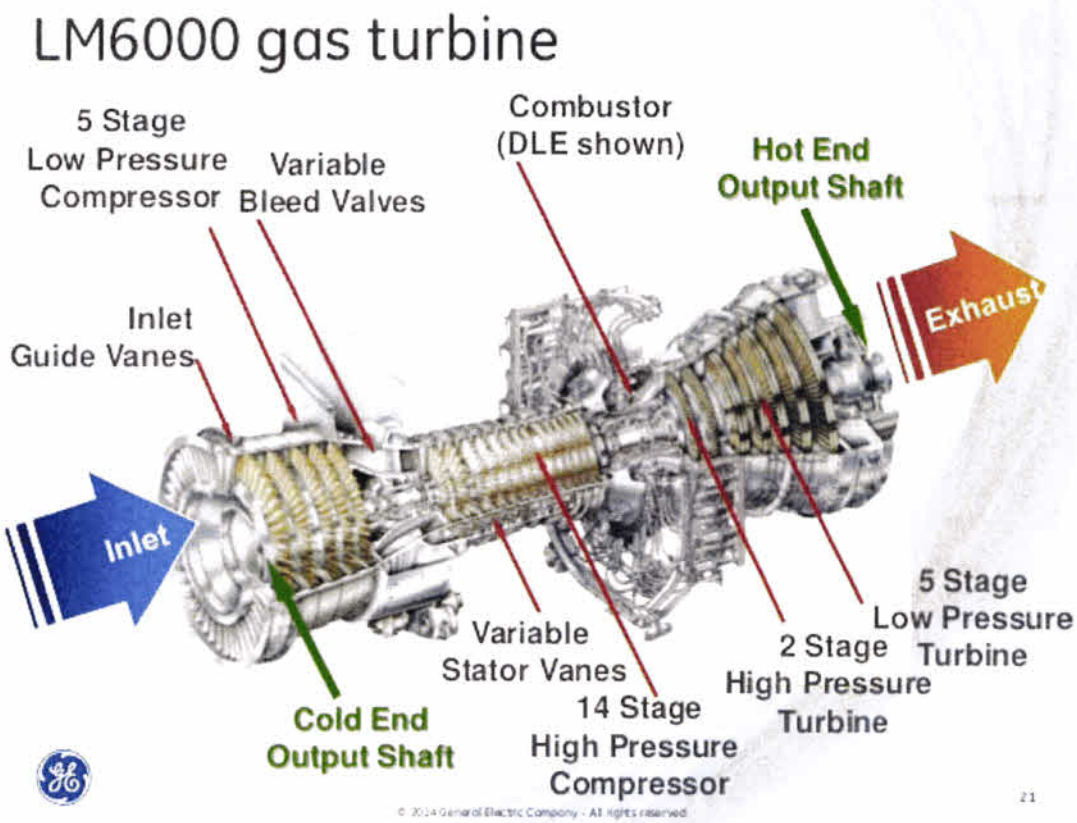

Figure 3-1. Diagram of a GE Model LM6000 Simple Cycle Combustion turbine (*from GE Company*)

The general specifications for these CTs provided by the manufacturer are summarized in Table 3-1. Note that the specifications in this table are for new turbines which have not undergone any performance degradation due to normal operation, and also do not account for efficiency reductions due to post combustion emission control systems.

Table 3-1. General Specifications for the GE LM6000PC Simple Cycle CTs

Parameter	Value
GE Model	LM6000PC (60 Hz)
Number of Units	16
ISO Base Output Power (Gross) at Sea Level	(51.1 MW each)820 MW
Heat Rate ISO Full Load (Net)	8,651 Btu/kW-hr (LHV)
Heat Input Rate Full Load (59 °F ambient)	490 MMBtu/hour (HHV)

The combustion turbine will be enclosed in a metal acoustical enclosure which also contains auxiliary equipment. Each combustion turbine package will be equipped with the following equipment:

- Inlet air filters
- Spray Intercooling (SPRINT)
- Inlet chillier or evaporative cooling
- Anti-icing system
- Metal acoustical enclosure to reduce sound
- Duplex shell and tube lube oil coolers for the combustion turbine and generator
- Annular standard combustor combustion system
- Water injection system for NOx control
- Compressor intercooler system
- Fire detection and protection system
- Hydraulic starting system
- Compressor variable bleed valve vent to prevent compressor surge in off-design operation.

3.2 Combustion Turbine Air Emissions Control Systems

The combustion gases exit the CTs at temperatures ranging from 760 °F to 1,100 °F. To enable the use of selective catalytic reduction (SCR) systems for the proposed turbines, an air injection system is included. This system supplies tempering air to the exhaust of the turbine section to reduce the exhaust gas temperature to around 800 °F at the catalyst inlet. The exhaust gases will then pass through two post combustion air quality control systems: oxidation catalysts for the control of carbon monoxide (CO) and volatile organic compounds (VOC), and high-temperature SCR systems for the control of NO_x emissions.

3.3 Wet Surface Air Coolers

The CT Project will include seven (7) wet surface air coolers ("WSAC") to provide cooling water for the inlet chillers for the existing and new CTs. Heated water/fluid from the inlet chillers to be cooled flows through tube bundles in a closed loop system. Water from the WSAC basin is sprayed downward over the tube surfaces. At the same time, fans induce air flow over the bundles in a co-current direction. The saturated air stream leaving the tube bundles then makes two 90-degree turns into the WSAC fan plenum removing any remaining large water droplets. This type of design allows for minimal water loss due to evaporation when compared to a traditional cooling tower. The project design involves routing water flow from up to four CTs to each of the WSAC for cooling. The maximum recirculation rate (spray rate) for each WSAC is 10,600 gallons per minute (gpm). Each WSAC will be equipped with high-efficiency drift eliminators to minimize the particulate matter emissions from the process from water droplets escaping the atmosphere.

4.0 SITE AND PROJECT EMISSIONS

This section presents a summary of the emission rates of regulated NSR pollutants for the existing operations and presents information about the project emissions increases of regulated NSR pollutants.

4.1 Regulated NSR Pollutants

The regulated NSR pollutants for PSD applicability purposes are particulate matter (PM), particulate matter equal to or less than an aerodynamic diameter of nominally 2.5 µm (PM2.5), NO_X as nitrogen dioxide (NO_2), sulfur dioxide (SO_2), NO_X and VOC as precursors for ozone, and CO.[5] The NNSR program covers particulate matter equal to or less than an aerodynamic diameter of nominally 10 µm (PM10).

4.2 Existing Operations at COE

Condition 4.C of the Class I permit limits emissions from the following existing units to 245 tons per 12-month period for CO, NO_X, VOC, PM10/PM2.5 and SO_2 (separately for each pollutant).

(a) Twelve (12) combustion turbines for normal operation as well as startup and shutdown duration.
(b) One diesel fuel-fired fire pump engine.

As previously noted, in a recent rulemaking, the U.S. EPA classified the West Pinal PM10 nonattainment area as 'serious.'[6] Therefore, as explained in the Major New Source Review Applicability Subsection 5.1.4, under the NNSR program, the 70 tpy

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[5] Per 40 CFR § 52.21(b)(49)(iv) (implemented per delegation agreement with EPA), greenhouse gases (GHGs) are potentially subject to regulation only if the existing stationary source or proposed new stationary source is a major stationary source, as that term is defined at 40 CFR § 52.21(b)(1), based on its PTE for a regulated NSR pollutant other than GHGs. Because neither the existing COE nor the proposed physical change is a major stationary source based on its emissions of non-GHG pollutants, GHGs are not considered subject to regulation for PSD.

[6] 85 Fed. Reg. 37756, June 24, 2020.

major source threshold applies for PM10. As further explained in the same subsection, as part of this application, SRP is requesting a more stringent PM10 emission limit from the existing operations at COE to less than 70 tpy (reduced from 245 tpy). Historical operations of the existing CTs has resulted in actual annual emissions that are far less than 70 tpy. In addition, historical performance testing for the existing CTs has shown PM10 emission rate below 0.005 lb/MMBtu. This emission rate is well below the PM10 emission factor of 0.01 lb/MMBtu used in the initial permitting of these units. Therefore, based on the available operational information for the existing CTs, the proposed PM10 emission limitation of less than 70 tpy is easily achievable and appropriate for this operation to maintain the minor source status of the existing operations at COE for NNSR program. Even though SRP is proposing to install inlet chilling for the existing CTs, no changes are proposed to the existing and proposed emission limitations for regulated NSR pollutants that are taken to avoid NNSR and PSD applicability for the existing emissions units at the COE site.

4.3 Proposed CT Project at COE

As previously noted, the proposed CT Project will be constructed at an existing stationary source that is not a 'major source' under R18-2-401(13): the emissions of all regulated NSR pollutants subject to PSD from the existing emissions units are each limited to 245 tpy and PM10 emissions, which are subject to nonattainment NSR, will be limited to less than 70 tpy as a result of this permit request. Therefore, the proposed CT Project is a physical change at an existing stationary source that is not a major source per R18-2-401(13)(a) or (b). For purposes of determining 'major source' applicability under R18-2-401(13)(c) for PSD and NNSR, the PTE of each regulated NSR pollutant from the proposed CT Project is quantified. The major source determination is made by comparing PTE of each regulated NSR pollutant from the proposed physical change to the applicable 'major source' thresholds under R18-2-401(13)(a) and (b) (depending on the attainment status for a particular criteria pollutant). A summary of the PTE calculations for the equipment proposed under the CT Project is presented below. Detailed emissions calculations are included in Appendix B of this application.

4.3.1 Potential to Emit of the Proposed Combustion Turbines

In accordance with definition of potential to emit under R18-2-101(110), SRP used the manufacturer's emissions data to estimate PTE of each regulated NSR pollutant for the proposed CTs.[7] For this purpose, we are using the CTs' emissions information for the site conditions at 55 °F ambient temperature, which corresponds to the worst-case emission rates of regulated NSR pollutants. Table 4-1 presents the design parameters for the proposed GE LM6000PC CTs.

Table 4-1. Design Parameters for the Proposed GE LM6000PC

Parameter	Value	Units
Number of units	16	
Maximum heat input (59 °F, 13.97 PSI, full load)	490	MMBtu/hour (HHV)
Number of startups per CT	730	events/year/CT
Startup duration	30	Minutes
Shutdown duration	9	Minutes

The air pollution control systems—SCR and oxidation catalysts—are not operational during the startup and shutdown of the aeroderivative combustion turbines. Water injection is used to reduce NOx emissions from these CTs. The earlier that water injection can be initiated during the startup process, the lower NOx emissions will be during startup. However, if injection is initiated at very low loads, it can impact flame stability and combustion dynamics, and it may increase CO emissions. These concerns must be carefully balanced when determining when to initiate water injection. SCR and oxidation catalyst systems are not fully functional during periods of startup and shutdown because the exhaust gas temperatures are too low for these systems to function as designed. During a startup, as the CT achieves minimum emissions compliance load ("MECL"), the CT emissions controls reduce the stack emission rates of NOx and CO below the emission rates for normal operation.

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[7] SO_2 emission rate is calculated based on the maximum fuel sulfur content.

For simple cycle CTs, the time required for startup is much shorter than CTs used in combined cycle applications.[8] The aeroderivative CTs are able to achieve full capacity within 10 minutes but the SCR requires a warm-up of up to 20 minutes to achieve optimum temperature for emissions control. Therefore, the unit achieves MECL in 30 minutes and for purposes of this permit application, emissions calculations have been conducted using the full 30 minutes for a startup cycle. The length of time for a normal shutdown, that is, the time from the MECL to the time when the flame out occurs, is normally 9 minutes. Therefore, the normal duration for a startup and a shutdown cycle is 39 minutes. The startup and shutdown annual emissions are calculated using the maximum number of startups and shutdowns cycles per year per aeroderivative CT. Particulate matter, NO_x, CO, and VOC emission rates during startup and shutdown, in terms of pounds per event, were provided by GE.

Maximum emission rates for particulate matter (PM/PM10/PM2.5), NO_x, CO, and VOC were obtained from GE for the 100% load condition, at site elevation, for 59 °F ambient temperature. SO_2 emission factor is calculated from the maximum natural gas fuel sulfur content. Calculations summary for other pollutants such as lead, greenhouse gases etc. are not included here as these are not critical from air permitting applicability standpoint.

Emissions rates specifications for the regulated NSR pollutants for the proposed aeroderivative simple cycle combustion turbines are summarized in Table 4-2.

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[8] In Table 4-3, the startup and shutdown emissions are detailed by event and the maximum annual emissions are also shown. Heating up the heat recovery steam generator (HRSG)and associated steam turbine system in a combined cycle setup requires a slow ramp up of the CT resulting in longer startup and shutdown duration versus a simple cycle CT without a HRSG.

Table 4-2. Emissions Specifications for CTs (GE LM6000PC)

Pollutant	Max Emission Rate for One CT	
	Normal Operation (lbs./hour)	lbs./SU-SD event
PM*	4.4	5.1
PM10	4.4	5.1
PM2.5	4.4	5.1
SO_2	0.5	0.33
NO_X	4.4	18.2
VOC	4.3	2.7
CO	7.6	32.3
* PM conservatively includes both filterable and condensable fractions.		

Table 4-3 below presents the restricted PTE for the proposed CT Project. Restricted PTE is based on the requested limit to keep project emissions below the major source thresholds under R18-2-401(13)(a) and (b).

Table 4-3. PTE for CTs

Regulated NSR Pollutant	Restricted Potential to Emit for One CT (TPY)	Restricted Potential to Emit for Sixteen CTs (TPY)
PM	4.0	63.3
PM10	4.0	63.3
PM2.5	4.0	63.3
SO_2	0.3	4.7
NO_X	8.8	141.5
VOC	3.1	50.2
CO	15.6	249.4

4.3.2 Potential to Emit of the Wet Surface Air Coolers

In a WSAC a small amount of the water is entrained in the induced air flow in the form of liquid phase droplets or mist. Demisters are used at the outlet of the exhaust fans to reduce the amount of water droplets entrained in the air. The water droplets that pass through the demisters and are emitted to the atmosphere are called drift loss. When these droplets evaporate, the dissolved solids in the droplet become particulate matter. Therefore, WSAC are sources of PM, PM10, and PM2.5 emissions.

WSAC particulate matter emissions are calculated based on the circulating water flow rate, the total dissolved solids (TDS) in the circulating water, and the design drift loss according to the following AP-42 equation:

$$E = k * Q * 60\left[\frac{min}{hour}\right] * 8.345\left[\frac{lb\ H2O}{gallon}\right] * \left[\frac{CTDS}{10^6}\right] * \left[\frac{DL}{100}\right]$$

Where, E = Particulate matter emissions, pounds per hour

Q = Circulating water flow rate, gallons per minute

CTDS = Circulating water total dissolved solids, ppm

DL = Drift loss, %

k = Particle size multiplier for PM10 and PM2.5[9]

The specifications for the proposed WSAC units are summarized in Table 4-4.

Table 4-4. Specifications for WSAC for Frame CTGs

Parameter	Value
Number of WSAC Units	7
Number of Fans	6
Maximum Circulating Water Flow (gpm) per WSAC Unit	10,600
Maximum Total Dissolved Solids (ppm)	5,000
Hours of Operation (same as CTs)	1,000
Design Drift Loss (%)	0.0005%

Table 4-5 presents the calculated PM, PM10, and PM2.5 restricted PTE for the WSAC, using the particle size multipliers developed from the CTDS value.

[9] PM10 and PM2.5 particle size multiplier from "*Calculating Realistic PM10 Emissions from Cooling Towers*"; Reisman & Frisbie (uses EPRI wet droplet size distribution), Environmental Progress, 2002.

Table 4-5. Restricted PTE for Seven WSAC Units

Pollutant	k Particle Size Multiplier	PTE	
		lb/hour	ton/year
PM	1.000	0.93	0.46
PM10	0.30	0.28	0.14
PM2.5	0.002	0.002	0.001

4.3.3 Project Emissions for Proposed CT Project

The project emissions for each regulated NSR pollutant are typically calculated by summing PTE for each of the Project-affected emissions units. In this case, restricted PTE for the proposed CTs (startup – shutdown and normal operation) and the WSAC is based on the proposed emission limit for each regulated NSR pollutant. As shown in Table 4-6 the project emissions increases (based on the restricted PTE) are below the applicable 'major source' thresholds specified under R18-2-401(13)(a) and (b) for all regulated NSR pollutants.

Table 4-6. Comparison of Project Emissions for CT Project with Major Source Thresholds

Pollutant	Restricted Potential to Emit for the CT Project (TPY)	R18-2-401(13)(a) and (b) Major Source Thresholds (TPY)
PM	69.9	250
PM10	69.9	70
PM2.5	69.9	250
SO_2	12.2	250
NO_x	249.5	250
VOC	249.5	250
CO	249.5	250

The proposed CT Project does not result in a new major source for any regulated NSR pollutant. Therefore, the requirements of R18-2-402(C) for a major source are not applicable to the proposed Project.

5.0 REGULATORY COMPLIANCE ANALYSIS

This section of the application documents SRP's review of Pinal County, State, and federal air quality regulations applicable or potentially applicable to the CT Project. Applicability conclusions are summarized by regulatory program. For each applicable regulation, specific requirements are documented.

5.1 County/State Regulations

This analysis is based on the latest version of Pinal County's Air Pollution Control Regulations available from the County's website and applicable A.A.C. Title 18 rules available from the website for Arizona Secretary of State's office. Under the Arizona Revised Statutes ("A.R.S.") 49-402, Arizona Department of Environmental Quality ("ADEQ") has original jurisdiction over "[m]ajor sources in any county that has not received approval from the administrator for new source review under the clean air act and prevention of significant deterioration under the clean air act." As noted in the December 13, 2016 ADEQ submittal, Pinal County nonattainment new source review rules are not approved in the state implementation plan for the area.[10] Specifically, ADEQ permitting regulations apply for major sources that are in Pinal County under a delegation agreement (see excerpt below).

> *The nonattainment area preconstruction permit program for the portions of the Moderate ozone nonattainment area located in Pinal County is administered by the Pinal County Air Quality Control District under a delegation agreement with the Arizona Department of Environmental Quality. Pinal County does not have an approved nonattainment new source review program. Under A.R.S. Section 49-402 A.1., the Arizona Department of Environmental Quality therefore has original jurisdiction over major sources located in the County, and the Department's permitting rules, rather than Pinal County's, apply to these sources.* [pp 4-47]

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[10] See, "*MAG 2017 Eight-Hour Ozone Moderate Area Plan for the Maricopa Nonattainment Area,*" Maricopa Association of Governments, December 2016, available at: https://static.azdeq.gov/aqd/2017_maricopa_o3_mod_pln.pdf (last accessed March 24, 2021).

In the preamble to the 2021 rulemaking for Air Plan Approval, Stationary Sources, New Source Review Updates, the U.S. EPA confirmed the ADEQ jurisdiction and delegation for major sources in Pinal County.[11]

> *The ADEQ has permitting jurisdiction for the following stationary source categories in all areas of Arizona: Smelting of metal ores, coal-fired electric generating stations, petroleum refineries, Portland cement plants, and portable sources. The ADEQ also has permitting jurisdiction for major and minor sources in the following counties: Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Mohave, Navajo, Santa Cruz, Yavapai, and Yuma. Finally, the ADEQ has permitting jurisdiction over major sources in Pinal County (currently delegated to Pinal County Air Quality Control District) and any source in Maricopa, Pima, or Pinal County for which the ADEQ asserts jurisdiction.*

Coolidge Generating Station will be a major source as defined in R18-2-401(13) after the CT Project permitting. Therefore, ADEQ's air permitting regulations are applicable for purposes of the proposed CT Project.[12]

5.1.1 R18-2-334 Minor New Source Review

In accordance with R18-2-334(A)(3), minor new source review permitting requirements are applicable to a modification that would increase the source's potential to emit equal to or greater than the permitting exemption threshold. A comparison of the regulated minor NSR pollutant PTE for the proposed CT project with the Permitting Exemption Thresholds under R18-2-101(101) is provided in Table 5-1.

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[11] 86 Fed. Reg. 31927, June 16, 2021.

[12] It is worth noting that the current Pinal County's Air Pollution Control Regulations for major sources under both PSD and NNSR are identical to ADEQ's regulations, but EPA has not yet approved these Pinal County regulations into the SIP. Pinal County has no SIP-approved NNSR regulations. Pinal County has a previously-SIP-approved PSD program, but this program is inapplicable here because, as discussed above, major sources in Pinal County are subject to ADEQ original jurisdiction.

Table 5-1. Comparison of Project Emissions for CT Project with Permitting Exemption Thresholds

Pollutant	Restricted Potential to Emit for the CT Project (TPY)	R18-2-101(101) Permitting Exemption Thresholds (TPY)	Whether above the exemption threshold?
PM10	69.9	7.5	Yes
PM2.5	69.9	5	Yes
SO_2	12.2	20	No
NO_X	249.5	20	Yes
VOC	249.5	20	Yes
CO	249.5	50	Yes

The restricted PTE of the proposed CT Project exceeds the permitting exemption thresholds for PM10, PM2.5, NO_X, VOC, and CO. Therefore, the minor new source review permitting requirements under this regulation are applicable to the proposed CT Project. Specifically, R18-2-334(C) requires a Class I permit revision involving a minor NSR modification to meet either reasonably available control technology ("RACT") under R18-2-334(C)(1) or an ambient air quality assessment under R18-2-334(C)(2). This application for a Class I permit revision constitutes SRP's application for an approval under this provision.

5.1.1.1 R18-2-334(C)(1) Reasonably Available Control Technology

R18-2-334(C)(1)(b) requires application of RACT as determined by the PCAQCD/ADEQ for each emissions unit with PTE greater than or equal to 20% of the permitting exemption threshold for a regulated minor NSR pollutant. In this case, SRP is conservatively proposing RACT for the CT project as shown in Table 5-2, irrespective of the level of emissions of regulated minor NSR pollutants from the specific project affected emissions units. We reviewed information in the U.S. EPA's RBLC database to determine RACT proposals for the proposed emission units.

Table 5-2. RACT Proposals for Regulated Minor NSR Pollutants for CT Project

Emission Unit	Pollutant	Proposed RACT
Simple Cycle Combustion Turbines	PM10/PM2.5	Good combustion practices Use of clean fuel (natural gas)
	NO_x	Selective catalytic reduction system
	VOC/CO	Oxidation catalyst
Wet Surface Air Coolers	PM10/PM2.5	Drift eliminators

5.1.1.2 R18-2-334(C)(2) Ambient Air Quality Assessment

Even though not specifically required at this time, in accordance with R18-2-334(C)(2)(b), SRP conducted an ambient air quality assessment for the proposed CT Project. A detailed ambient air quality assessment report will be submitted in the near future upon incorporation of any comments/changes from the review of the modeling protocol. This assessment confirms that that the ambient concentrations resulting from the modification combined with the existing concentration of regulated Minor NSR pollutants will not interfere with attainment or maintenance of a national ambient air quality standard ("NAAQS").

5.1.2 R18-2 Article 4 Permit Requirements for New Major Sources and Major Modifications to Existing Major Sources

R18-2-401 through -412 are the NNSR and PSD provisions applicable to new major stationary sources or projects that are major modifications for regulated NSR pollutants. As previously noted, COE is located in the 'West Pinal PM10 Nonattainment Area' as shown in Figure 3-1 below. The area is 'serious' nonattainment for PM10 and attainment or unclassifiable for all other criteria pollutants. The PTE of all regulated NSR pollutants other than PM10 for the existing emissions units at the COE site is limited by the permit below the 250 tpy threshold applicable under R18-2-401(13)(b). In this application, SRP is requesting a permit limit for the PM10 PTE of existing operations below the 70 tons per year threshold applicable under R18-2-401(13)(a). Therefore, COE is an existing stationary source, that is not a 'major source' as defined in the NNSR and PSD regulations at R18-2-401(13).

Changes to existing stationary sources that are not major sources are addressed as follows:

> *"A major source includes a physical change that would occur at a stationary source, not otherwise qualifying under subsection [R18-2-401](13)(a) or (b) as a major source, if the change would constitute a major source by itself."* [R18-2-401(13)(c)]

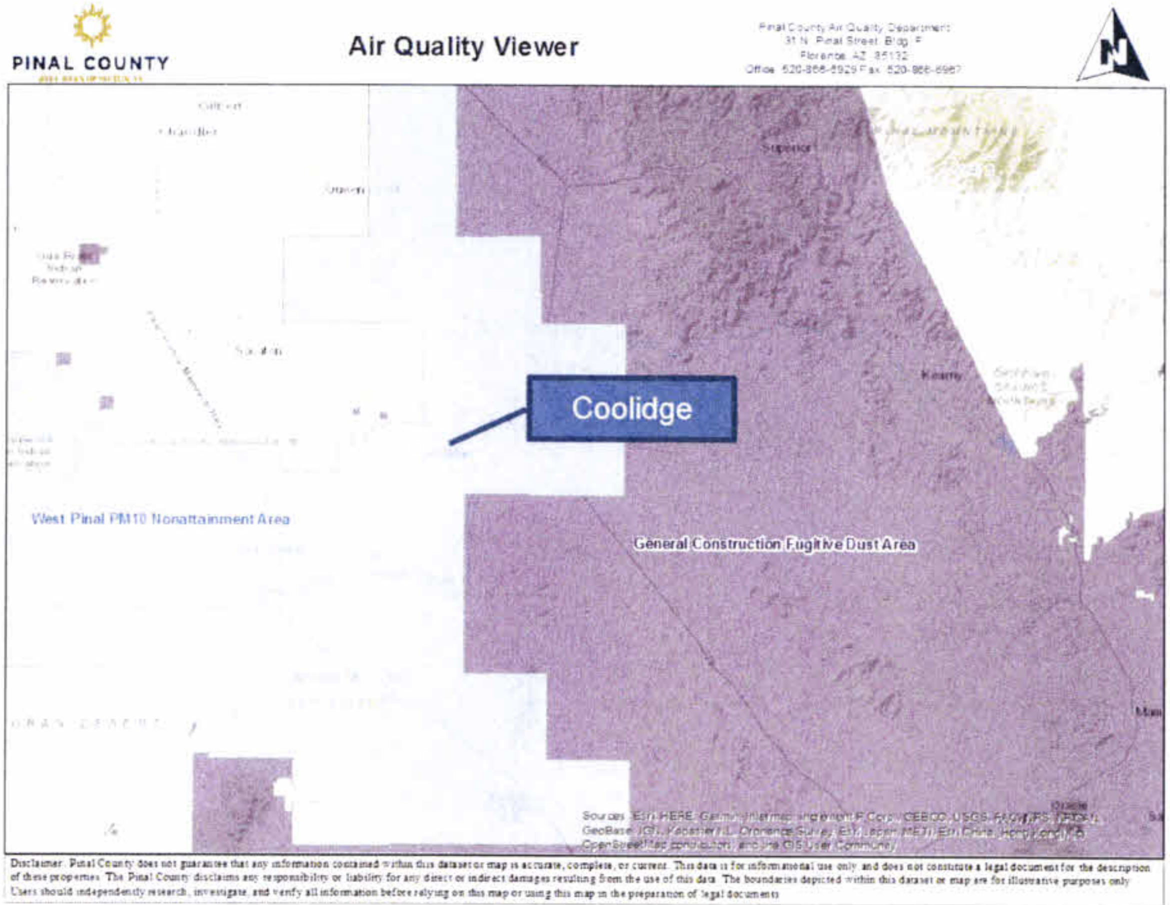

Figure 3-1. Coolidge Generating Station Location in West Pinal PM10 Nonattainment Area

In accordance with R18-2-401(13)(c), SRP evaluated PTE for PM, PM10, PM2.5, SO_2, NO_x, CO, and VOC associated with the proposed CT Project against the major source thresholds under R18-2-401(13)(a) and (b). The results of this analysis are summarized in Table 4-6 and detailed calculations are provided in Appendix B. The proposed CT Project emissions for all regulated NSR pollutants are less than the 'major source' thresholds in R18-2-401(13)(a) and (b). Thus, the proposed CT Project does not constitute a major source and is not subject to the NNSR or PSD permitting requirements.

5.1.3 Code § 3-2-195 Significant Permit Revision to a Class I Permit

In accordance with Pinal County Code § 3-2-190 and R18-2-319(A)(4), any changes that require establishment of a permit term or condition to avoid an otherwise applicable requirement are not considered a minor permit revision and are subject to significant permit revision requirements under Code § 3-2-195 and R18-2-320(A). As explained in Subsection 4.3.3, SRP is requesting enforceable emission limitations to keep the CT Project increase below the major source thresholds under R18-2-401(13)(a) and (b). Therefore, a significant permit revision to the Class I Permit per Code § 3-2-195 and R18-2-320 is required for the proposed CT Project. This document and its attachments fulfill the requirements for an application for a significant permit revision under Code § 3-2-195 and R18-2-320.

In addition to the CT Project, SRP is also proposing additional changes to the existing permit terms and conditions under the Class I Permit V20676.A01 pertaining to the existing emissions units at the COE site. However, these changes do not change the air permitting applicability outlined here. Section 6.0 presents SRP's proposed changes to the existing permit terms and conditions.

5.1.4 Code § 3-7-590 Class I Permit Fees

Per Code § 3-7-590.D.2, an application fee of $1,000 is applicable for an application for a significant permit revision to a Class I permit. A check for the application fee payable to "Pinal County Air Quality Control Department" is attached to this application.

5.1.5 Code § 5-23-1010 Standards of Performance for Stationary Rotating Machinery

In accordance with Code § 5-23-990, requirements of this standard are applicable to the proposed 'stationary gas turbines' under the CT Project. For equipment with heat input less than 4,200 MMBtu per hour, maximum allowable particulate matter emissions are determined using the following equation:

$$E = 1.02 * Q^{0.769}$$

Where: E = the maximum allowable particulate emissions rate in pounds-mass per hour

Q = the total heat input of all operating fuel burning units on a plant or premises in MMBtu per hour

In addition, the proposed CTs are not allowed to emit smoke for any period greater than 10 consecutive seconds which exceeds 40% opacity. Visible emissions when starting cold equipment shall be exempt from this requirement for the first 10 minutes.

The proposed CTs will only use natural gas and will follow these standards.

5.1.6 Other County Requirements

There are no changes to the other applicable requirements under County's regulations. These requirements are already listed under the Class I Permit for Coolidge Generating Station.

5.2 Federal Regulations

5.2.1 New Source Performance Standards (40 CFR Part 60; Code Chapter 6)

Some of the federal new source performance standards ("NSPS") requirements are incorporated by reference in Code §6-1-030. Applicability of the NSPS requirements for the proposed units is presented below.

5.2.2 40 CFR Part 60, Subpart A Standards of Performance for Stationary Combustion Turbines

SRP will comply with the applicable requirements under general provisions of 40 CFR Part 60 Subpart A. These will include notifications, compliance testing, monitoring, recordkeeping, and reporting provisions of the rule.

5.2.3 40 CFR Part 60, Subpart KKKK Standards of Performance for Stationary Combustion Turbines

This NSPS Subpart applies to stationary combustion turbines for which construction, modification or reconstruction commences after February 18, 2005. The sixteen (16) proposed natural gas-fired simple cycle stationary combustion turbines meet the affected facility definition under this standard. Therefore, the following NSPS requirements will apply to the proposed CTs under the Project.

(a) Comply with the NO_X emission limit of 25 ppm at 15 percent oxygen (O_2) or 1.2 lb/MWh (for combustion turbine firing natural gas with heat input greater than 50 MMBtu per hour and less than or equal to 850 MMBtu per hour) on a four (4) hour rolling average basis while the unit is operating at greater than or equal to 75% of peak load. (40 CFR § 60.4320 and Table 1, 40 CFR § 60.4350(h))

(b) Comply with the alternate NO_X emission limit of 96 ppm at 15 percent O_2 or 4.7 lb/MWh (for combustion turbine firing natural gas with output greater than 30 MW) on a four (4) hour rolling average basis when combustion turbines are operating at less than 75% of peak load. (40 CFR § 60.4320 and Table 1, 40 CFR § 60.4350(g))

(c) Comply with the SO_2 emission limit of 0.9 pounds per megawatt-hour gross output, or not burn any fuel which contains total potential sulfur emissions in excess of 0.060 lb of SO_2 per MMBtu heat input. (40 CFR § 60.4330)

(d) Compliance requirement – The simple cycle combustion turbines, SCR, and monitoring equipment must be operated and maintained in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunctions. (40 CFR § 60.4333)

(e) Option to use a NO_x continuous emissions monitoring system (CEMS). SRP will use the CEMS installed, certified, and operated in accordance with 40 CFR Part 75 Appendix A. (40 CFR §§ 60.4335(b) and 60.4345(a))

(f) The requirement to monitor fuel sulfur for SO_2 monitoring does not apply if potential sulfur emissions expressed as SO_2 are less than 0.060 lb/MMBtu. SRP proposes to use fuel tariff sheet or purchase contract information or representative fuel sampling performed per 40 Part 75 Appendix D to show that fuel sulfur will comply with the applicable limit. (CFR §§ 60.4360 and 60.4365)

(g) SRP proposes to use NO_x CEMS RATA as the initial NO_x performance test. (40 CFR § 60.4405)

(h) No annual performance test is required due to the presence of NO_x CEMS. (40 CFR § 60.4340(b)(1))

(i) Comply with the reporting requirements in 40 CFR § 60.4375 regarding excess emissions and monitor downtime.

5.2.4 40 CFR Part 60, Subpart TTTT Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units

This NSPS applies to carbon dioxide (CO_2) emissions from certain stationary combustion turbines. As specified in 40 CFR § 60.5509(a) of this subpart, the GHG standards included in this subpart apply to any steam generating unit, IGCC, or stationary combustion turbine, all of which are designated as electric generating units (EGUs), that commenced construction after January 8, 2014 or commenced reconstruction after June 18, 2014 and that meets the applicability conditions below:

(1) Has a base load rating greater than 250 MMBtu per hour of fossil fuel (either alone or in combination with any other fuel); and

(2) Serves a generator or generators capable of selling greater than 25 MW of electricity to a utility power distribution system.

The sixteen (16) proposed simple cycle combustion turbines, each have a base load rating greater than 250 MMBtu per hour of fossil fuel and serve generators capable of selling greater than 25 MW of electricity. Therefore, these units are subject to the requirements of this standard.

Per 40 CFR § 60.5520(a), the proposed CTs will be subject to the CO_2 emission standards specified in Table 2 of 40 CFR 60 Subpart TTTT. The proposed units are "non-base load" type as they will combust more than 90% natural gas on a heat input basis (100%), and SRP plans to limit net electric sales for each CT to less than its design efficiency (or 50% whichever is less), multiplied by its potential electric output on a 12-operating month basis or 3-year rolling average basis. Therefore, these units will be subject to the nominal CO_2 limitation of 120 lb per MMBtu on a 12-month rolling average basis (40 CFR § 60.5520, 40 CFR § 60.5525, and Table 2).

In 40 CFR § 60.5520(d), stationary combustion turbines are subject to a heat input-based standard in Table 2 of this subpart that are only permitted to burn one or more uniform fuels, as described in 40 CFR § 60.5520(d)(1), are only subject to the monitoring requirements in 40 CFR § 60.5520(d)(1) as follows:

> *Stationary combustion turbines that are only permitted to burn fuels with a consistent chemical composition (i.e., uniform fuels) that result in a consistent emission rate of 160 lb CO_2/mmBtu or less are not subject to any monitoring or reporting requirements under this subpart. These fuels include, but are not limited to, natural gas, methane, butane, butylene, ethane, ethylene, propane, naphtha, propylene, jet fuel kerosene, No. 1 fuel oil, No. 2 fuel oil, and biodiesel. Stationary combustion turbines qualifying under this paragraph are only required to maintain purchase records for permitted fuels.*

The proposed simple cycle combustion turbines will be permitted to only burn natural gas which is classified as a uniform fuel. Therefore, per 40 CFR § 60.5520(d)(1), the proposed CTs are not subject to any monitoring or reporting requirements under this standard and are only required to maintain purchase records for the permitted fuels.

5.2.5 National Emission Standards for Hazardous Air Pollutants (40 CFR Part 63; Code Chapter 7)

Some of the National Emissions Standards for Hazardous Air Pollutants ("NESHAP") requirements are incorporated by reference in Code §7-1-030. Applicability of the NESHAP requirements for the proposed units is presented below. Source-wide PTE, of single HAPs and combination of HAPs after the proposed project is proposed to be limited to less than 10 tons per year and 25 tons per year, respectively. With this project SRP is requesting to keep the station as an area source under 40 CFR § 63.2 for applicability of NESHAP requirements.

5.2.6 40 CFR Part 63, Subpart YYYY NESHAP for Stationary Combustion Turbines

Coolidge Generating Station is an area source of hazardous air pollutants. Therefore, the requirements of NESHAP 40 CFR Part 63 Subpart YYYY do not apply to this Project.

5.2.7 40 CFR 64 – Compliance Assurance Monitoring

The Compliance Assurance Monitoring ("CAM") program is codified in 40 CFR Part 64. CAM plan requirements apply to any pollutant specific emissions unit with uncontrolled potential emissions above the major source threshold (70 tpy for PM10 or 100 tpy of any other air pollutant) that uses a control device to achieve compliance with an emission limitation or standard. Only the uncontrolled NO_X and CO emissions for the simple cycle combustion turbines will exceed this threshold. SRP is proposing to use continuous emissions monitoring systems ("CEMS") for monitoring of NO_X and CO emissions from the proposed units. We request that the CEMS requirements be included in the Class I permit for COE. Thus, in accordance with 40 CFR § 64.2(b)(1)(vi), CAM plan requirements do not apply for NOx and CO emissions from the proposed units.

5.2.8 Acid Rain Program (40 CFR Part 72 and Code Chapter 3, Article 6)

The federal acid rain program requirements at 40 CFR Part 72 are incorporated by reference in Code §3-6-565(A). Per 40 CFR §72.6(a)(3)(i), a 'utility unit,' that is a 'new unit' is considered an affected unit. Any source that includes such an affected unit shall be an affected source, subject to the requirements of the Acid Rain Program in 40 CFR Part 72. A "utility unit" means a unit owned or operated by a utility that serves a generator in any State that produces electricity for sale. Finally, "Unit" means a fossil fuel-fired combustion device. Because the new simple cycle combustion turbine fire natural gas and produce electricity for sale, these are affected units under the federal Acid Rain Program. SRP will submit an Acid Rain Permit application to EPA and provide a copy to PCAQD.

6.0 PROPOSED PERMIT TERMS AND CONDITIONS

This section of the application presents proposed permit terms and conditions for the Class I Permit for Coolidge Generating Station.

As provided under Code § 3-1-084 and R18-2-306.01, SRP is proposing the following voluntary emission limitations for the existing and the proposed operations at the COE site to keep below the applicable 'major source' thresholds under R18-2-401(13)(a) and (b).

(A) Revise the existing Condition 4.C.1 as follows for the existing operations at the COE site.

> Operation of the facility, including the number of emission units (CTG's) operating along with the fire pump engine operation, the duration of unit-specific operation, start-up and shut-down events, and the unit-specific loading, shall be limited in combination such that emissions, including the emissions generated during start-up and shutdown events, of any of CO, NO_X, VOC, ~~PM10/~~PM2.5 and SO_2 from the facility shall not exceed a cap of 245 tons per 12-calendar-month period per pollutant **and of PM10 from the facility shall not exceed 69.9 tons per 12-calendar-month period**.

(B) Revise the existing Condition 5.C.1 as follows for the existing CTs at the COE site to include alternative limitations that apply under the NSPS 40 CFR 60 Subpart KKKK per 40 CFR §60.4325.

1. NO_X Emission Limitation NSPS Subpart KKKK [40 CFR §60.4325]

~~No gases shall be discharged to the atmosphere from the combustion turbine which contains greater than 25 ppm of nitrogen oxides at 15 percent oxygen or 150 ng/J of useful output.~~

(a) No gases shall be discharged to the atmosphere from the combustion turbine which contains greater than 25 ppm of nitrogen oxides at 15%

oxygen or 150 ng/J of useful output while the combustion turbine is operated at greater than or equal to 75% of the peak load.

(b) No gases shall be discharged to the atmosphere from the combustion turbine which contains greater than 96 ppm of nitrogen oxides at 15% oxygen or 590 ng/J of useful output while the combustion turbine is operated at less than 75% of the peak load.

(C) With the addition of alternative NO_X limit of 96 ppm for the existing CTs under Condition 5.C.1, Conditions 5.D.1 and 2 are redundant and should be deleted.

~~1. Definitions~~

~~a. "Start-up" is defined as the 32-minute period following an initiation of fuel flow.~~

~~b. "Shutdown" is defined as the 12-minute period prior to shut-off the fuel supply.~~

~~c. "Malfunction" is defined as any sudden and unavoidable failure of air pollution control equipment, process equipment or a process to operate in a normal and usual manner, but does not include failures that are caused by poor maintenance, careless operation or any other upset condition or equipment breakdown which could have been prevented by the exercise of reasonable care.~~

~~2. Start-up and Shutdown Emissions~~

~~Anytime during the start-up or shutdown of the units, if the NOx emissions exceed 25 ppm, then in accordance with the definition of excess emissions in Section §6.E.1 of this permit, these excess emissions will be reported monthly to the department (All Modes Report). Although these excess emissions are not considered to be violations of the NOx emission limit, Permittee shall continue to exercise "good combustion practice" consisting of adherence to standard operating procedure.~~

(D) SRP is proposing changes to Condition 5.H to correct an error in the regulatory citation reference and corrections to the exponent in the particulate matter equations.

1. SIP Limitation [Currently federally enforceable pursuant to ~~PGAQCD~~ **PCAQCD** Reg. 7-3-1.7 (3/31/75) approved as a SIP element at 43 FR 50531 (11/15/78)]

For equipment with a heat input capacity of ~~greater ten but~~ less than 4,000 million Btu per hour, particulate emissions shall not exceed[1]:

~~E = 1.02X-.231~~ **$E = 1.02X^{-.231}$**, where E = allowable rate of emissions in lbs per million BTU heat input, and

X = maximum heat input capacity in million BTU per hour.

2. Current Code Limitation (§5-23-1010)

For equipment with a heat input capacity of less than 4,200 million Btu per hour, particulate emissions shall not exceed3:

E = ~~1.02Q0.769~~ **$1.02Q^{0.769}$**, where E = maximum emissions in lbs./hr.

Q = maximum heat input of all operating fuel burning units on a plant premises, in million BTU per hour.

(E) Based on the guidance from PCAQCD and testing requirements for similar facilities, SRP requests changes to the performance testing requirements in Condition 6 to require two CTs tested per permit period (5 years), for a representative sampling of all units. Coolidge Generating Station historically operates at 1-2% of the allowed VOC and PM10 emission limits of 245 tons per year for each pollutant. Further for NO_X and CO CEMS are used as the compliance demonstration and therefore only the RATAs are required. For SO_2 gas sampling is used to show compliance. The permit correctly identifies that the RATA is conducted for CO but for NO_X the current permit requires annual performance testing which is not required under Part 60 Subpart KKKK. Proposed changes are shown below

Condition 6.A.1

1. Performance Tests [40 CFR 60.8, Code §§3-1-160 & 3-1-170)

At least once during the 5-year permit term, Permittee shall conduct performance tests for VOCs and PM10. At least two CTs shall be selected for testing and used to represent all of the identical CTs at the facility to

meet this requirement and used for emissions calculations and emissions inventory. Selection of the CTs tested shall be rotated for each subsequent testing. ~~Within one year of the previous performance test but no later than fourteen (14) months of the test,~~ Permittee shall conduct performance tests, using standard test methods specified below, or equivalent methods as approved by the District pursuant to approval of the test plan required below. The tests shall be conducted using standard test methods approved by the EPA (40 CFR Part 60). These tests shall be performed at the maximum practical production rate. The continuous monitoring systems required by this permit shall be in place and operating prior to conducting the performance tests. Each performance tests shall address:

~~a. Nitrogen oxides emissions Ref. Part 60, App. A, Ref. Method 7E or 20.~~
~~b. Carbon monoxide emissions Ref. Part 60, App. A, Ref. Method 10~~
c. Particulate matter emissions (filterable PM10) Ref. Part 60, App. A, Ref. Method
5 or 201A and (condensable PM10) Method 202.
d. Volatile organic compound emissions Ref. Part 60, App. A, Ref. Method 25a
~~e. Opacity Ref. Part 60, App. A, Ref. Method 9, 40 CFR §60.11.~~

Condition 6.A.3

3. Subsequent Performance Testing (Code §3-1-050)
   a. PM Non-NSPS Testing Requirements
      Permittee shall conduct ~~annual~~ testing of turbines for particulate matter using the testing methods listed in Section §6.A.1 of this permit.
   b. CO Non-NSPS Testing Requirements
      Performance testing for carbon monoxide shall be covered under annual Relative Accuracy Test Audits (RATA).
   c. VOC Non-NSPS Testing Requirements
      Permittee shall conduct ~~annual~~ testing of turbines for volatile organic compounds using the testing methods listed in Section §6.A.1 of this permit.

d. NO_X NSPS Testing Requirements [40 CFR Part 60, Subpart KKKK §60.4400]

Performance testing for nitrogen oxides shall be covered under annual Relative Accuracy Test Audits (RATA).

~~Permittee shall conduct subsequent nitrogen oxides performance tests on an annual basis, no more than 14 calendar months following the previous performance test. Test method listed in Section §6.A.1 of this permit shall be used.~~

e. SO_2 NSPS Testing Requirements [40 CFR Part 60, Subpart KKKK, §60.4415]

Permittee shall conduct subsequent sulfur dioxide performance tests on an annual basis, no more than 14 calendar months following the previous performance test. One of the three methodologies described in Section §60.4415 of the Subpart KKKK can be used to conduct the performance tests.

(F) SRP requests deletion to application of the bias adjustment factor under Condition 6.C.1.b for demonstration of compliance with the 245-tons per year synthetic minor limit calculations of the 12-month rolling average. Any adjustments should be applied only to future emissions as required by the Federal regulations (40 CFR Part 75). The application of a bias adjustment factor retroactively would create inconsistencies with reported emissions under the Acid Rain Program and the emissions reported on a semiannual basis as required by Condition 6.H.

1. Compliance with Synthetic Minor Limitations

~~a.~~ To comply with the operational limitations as specified in Section §4.C of this permit, Permittee shall on the 10th day of each month calculate actual 12 month rolling emissions and a 12 month rolling emissions "budget." This emission budget shall be based on the past 10 months of historical emissions data and the amount of emissions (or emissions budget) that could be allowable in the upcoming 2 months (including the current month) without exceeding the 245 tons per year per pollutant synthetic minor limit.

~~b. To the extent the application of the bias adjustment factor as determined under §6.D.4 results in an increase of emissions during the reference period since the previous RATA test, by the 10th of the month following the completion of the latest RATA test, permittee shall correspondingly demonstrate continued continuous compliance with the 245 ton per year synthetic minor limit by recalculating the 12 month rolling average of emissions for each prior month affected by application of the bias adjustment factor.~~

(G) SRP requests the removal of the 30-day rolling average requirement in Condition 6.E.1. COE units are subject to the simple cycle unit without heat recovery requirements described in 40 CFR § 60.4350.g, which only references a 4-hour rolling average requirement.

1. An excess emission is any unit operating period in which the 4-hour ~~or 30-day~~ rolling average NOX emission rate exceeds the applicable emission limit in §60.4320. For the purposes of this subpart, a "4-hour rolling average NOX emission rate" is the arithmetic average of the average NOX emission rate in ppm or ng/J (lb/MWh) measured by the continuous emission monitoring equipment for a given hour and the three unit operating hour average NOX emission rates immediately preceding that unit operating hour. Calculate the rolling average if a valid NOX emission rate is obtained for at least 3 of the 4 hours.

(H) Add the following permit conditions for the sixteen combustion turbines ("CTs") (CT13 through CT28) and seven wet surface air coolers ("WSAC") (WSAC1 through WSAC7) to be permitted under the CT Project.

(1) Emission Limitations

a. The Permittee shall not cause or allow the PM/PM10/PM2.5 emissions from CT13 through CT28 and WSAC1 through WSAC7 more than 69.9 tons per 12-month rolling total sum (combined totals for all emissions units noted here including normal operation and startup/shutdown duration).

b. The Permittee shall not cause or allow the NO_X emissions from CT13 through CT28 more than 249.9 tons per 12-month rolling total sum (combined total for all emissions units noted here including normal operation and startup/shutdown duration).

c. The Permittee shall not cause or allow the VOC emissions from CT13 through CT28 more than 249.9 tons per 12-month rolling total sum (combined totals for all emissions units noted here including normal operation and startup/shutdown duration).

d. The Permittee shall not cause or allow the CO emissions from CT13 through CT28 more than 249.9 tons per 12-month rolling total sum (combined totals for all emissions units noted here including normal operation and startup/shutdown duration).

(2) Compliance Demonstration

a. Within 60-days after achieving maximum production rate of each CT (CT13 through CT28), but no later than 180 days after the initial start-up of the CT, Permittee shall conduct performance tests, using standard test methods approved by the EPA (40 CFR Part 60) specified below, or equivalent methods as approved by the District pursuant to approval of the test plan required below. These tests shall be performed at the maximum practical production rate. The continuous monitoring systems required by this permit shall be operating prior to conducting the performance tests. The performance tests shall address:

i. Nitrogen oxides emissions: Ref. Part 60, App. A-4, Ref. Method 7E

ii. Carbon monoxide emissions: Ref. Part 60, App. A-4, Ref. Method 10

iii. Particulate matter emissions (PM10, PM2.5): Ref. Part 60, App. A-3, Ref. Method 5 and Ref. Part 51 App. M, Ref. Method 202

iv. Volatile organic compounds emissions: Ref. Part 60, App. A-7, Ref. Method 25a

b. The Permittee shall document the drift specification for the drift eliminators used to control particulate matter emissions from the WSAC units (WSAC1 through WSAC7) from the manufacturer's specification or other engineering information.

(3) Instrumental Emissions Monitoring Requirements– Nitrogen Oxides & Carbon Monoxide

a. The Permittee shall install, calibrate, maintain, and operate continuous emissions monitoring systems on CT13 through CT28, and record the output of each system, for measuring nitrogen oxides and carbon monoxide emissions to the atmosphere during startup and shutdown events and the normal operation of the combustion turbines. Monitoring equipment required under this subsection shall be installed and operated in accordance with a plan submitted to the District by the permittee.

b. On a calendar-month basis, Permittee shall generate a record of cumulative actual nitrogen oxides and carbon monoxide emissions from CT13 through CT28 emitted for the previous month and for the preceding 12- months and shall compare that total to the annual nitrogen oxide and carbon monoxide emissions limitations imposed under Condition ____. The Permittee shall maintain a record of those monthly total calculations, and monthly conclusion regarding compliance with the emission limitations under ______

(4) Monitoring Requirements – Particulate Matter

a. The Permittee shall install, calibrate, maintain, and operate a continuous monitoring system on CT13 through CT28, and record the output of the system, for measuring the amount of fuel used. Monitoring equipment required under this subsection shall be installed and operated in accord pursuant to a plan submitted to the District by the permittee.

b. The Permittee shall maintain records of number of startups for CT13 through CT28 pursuant to a plan submitted to the District by the permittee.
c. Except as provided below, the following PM/PM10/PM2.5 emission factors have been approved by the Control Officer and shall be used to calculate emissions from CT13 through CT28: 0.009 pounds per MMBtu heat input for non-startup periods, 5.1 pounds per shutdown and startup event (combined). For each simple-cycle combustion turbine, once initial performance testing has been performed per Condition ___, the highest PM/PM10/PM2.5 emission factor for non-startup periods for such simple-cycle combustion turbine (expressed in pounds per MMBtu heat input) shall be used until superseded by the results of subsequent performance testing.
d. The Permittee shall install, calibrate, maintain, and operate a monitoring system on WSAC1 through WSAC7, and record the output of the system, for measuring the amount of recirculation water used in the system. Monitoring equipment required under this subsection shall be installed and operated in accord pursuant to a plan submitted to the District by the permittee.
e. Once per quarter, the Permittee shall measure conductivity (as surrogate for TDS) or TDS for recirculation water for WSAC1 through WSAC7 pursuant to a plan submitted to the District by the permittee.
f. Monthly PM/PM10/PM2.5 emissions calculations:
    i. The Permittee shall calculate the quantity of emissions monthly during normal operation for PM/PM10/PM2.5 by multiplying the aggregate fuel flows/heat input for CT13 through CT28 by the corresponding PM/PM10/PM2.5 emission factors established per Condition ___.c above.
    ii. The permittee shall calculate the quantity of emissions monthly for startup and shutdown events for PM/PM10/PM2.5 by multiplying the number of events for CT13 through CT28 by the

corresponding PM/PM10/PM2.5 emission factor established per Condition ___.c above.

iii. The permittee shall calculate the quantity of emissions monthly for WSAC1 through WSAC16 by using the following equation.

$$E = k * Q * 60 \left[\frac{min}{hour}\right] * 8.345 \left[lb \frac{H2O}{gallon}\right] * \left[\frac{CTDS}{10^6}\right] * \left[\frac{DL}{100}\right]$$

Where, E = Particulate matter emissions, pounds per hour

Q = Circulating water flow rate, gallons per minute

CTDS = Circulating water total dissolved solids, ppm

DL = Drift loss, %

k = Particle size multiplier for PM10 and PM2.5[13]

g. On a calendar-month basis, Permittee shall generate a record of cumulative actual PM/PM10/PM2.5 emissions from CT13 through CT28 and WSAC1 through WSAC7 emitted for the previous month and for the preceding 12- months and shall compare that total to the annual PM/PM10/PM2.5 emissions limitations imposed under Condition ____. The Permittee shall maintain a record of those monthly total calculations, and monthly conclusion regarding compliance with the emission limitations under ______.

(5) Monitoring Requirements – Volatile Organic Compound

a. Except as provided below, the following VOC emission factors have been approved by the Control Officer and shall be used to calculate emissions from CT13 through CT28: 0.009 pounds per MMBtu heat input for non-startup periods, 2.7 pounds per shutdown and startup

[13] PM10 and PM2.5 particle size multiplier from "*Calculating Realistic PM10 Emissions from Cooling Towers*"; Reisman & Frisbie (uses EPRI wet droplet size distribution), Environmental Progress, 2002.

event (combined). For each simple-cycle combustion turbine, once initial performance testing has been performed per Condition ___, the highest VOC emission factor for non-startup periods for such simple-cycle combustion turbine (expressed in pounds per MMBtu heat input) shall be used until superseded by the results of subsequent performance testing.

b. Monthly VOC emissions calculations:
   i. The Permittee shall calculate the quantity of emissions monthly during normal operation for VOC by multiplying the aggregate fuel flows/heat input for CT13 through CT28 by the corresponding VOC emission factors established per Condition ___.c above.
   ii. The permittee shall calculate the quantity of emissions monthly for startup and shutdown events for VOC by multiplying the number of events for CT13 through CT28 by the corresponding VOC emission factor established per Condition ___.c above.

c. On a calendar-month basis, Permittee shall generate a record of cumulative actual VOC emissions from CT13 through CT28 emitted for the previous month and for the preceding 12- months and shall compare that total to the annual VOC emission limitations imposed under Condition ____. The Permittee shall maintain a record of those monthly total calculations, and monthly conclusion regarding compliance with the emission limitations under ______.

APPENDIX A

CLASS I PERMIT REVISION APPLICATION FORMS

Pinal County Air Quality Control District

P.O. Box 987 – Florence, AZ 85132 P-(520) 866-6929 F-(520) 866-6967

PINAL COUNTY
WIDE OPEN OPPORTUNITY

Permit Application

(As required by A.R.S. §49-480, and Chapter 3, Article I, Pinal County Air Quality Control District Code of Regulations)

1. Permit to be issued to: Salt River Project Agricultural Improvement and Power District
(Name and legal status (e.g. corporation or proprietorship) or organization that is to receive permit)

2. Mailing Address: P.O. Box 52025 PAB 359
City: Phoenix State: Arizona Zip: 85072-2025
Billing Address (if different from above):
City: State: Zip:

3. Plant Name (if different from above): Coolidge Generating Station

4. Name(s) of Owner or Operator: Salt River Project Agricultural Improvement and Power District
Phone:

5. Plant/Site Manager: Maria Roberts Phone: (602) 236-4328 Fax:

6. Contact Person: Zachary J Harbrin Phone: (602) 236-5779 Fax:
Email Address: Zachary.Harbin@srpnet.com

7. Equipment/Plant Location or Proposed Location Address: 859 East Randolph Road
City: Coolidge Zip: 85128 Parcel #: 503-34-015B
Section/Township/Range:
Latitude/Longitude: 32.55.01N, 111.30.15W Elevation: 1443

8. General Nature of Business: Electric generation
Standard Industrial Classification Code: 4911

9. Type of Organization

- [ ] Corporation State of Incorporation:
- [ ] Arizona Limited Liability
- [ ] Government Entity Government Facility Code:
- [ ] Individual Owner
- [ ] Partnership
- [x] Other (Specify): Agricultural Improvement District / Political Subdivision of the State of Arizona

10. Permit Application Basis: (Check all that apply)

- [ ] New Source
- [x] Permit Revision
- [ ] Administrative Change
- [ ] Renewal of Existing Permit
- [ ] Portable Source
- [ ] General Permit
- [ ] Permit Transfer

For renewal or modification, include existing permit number: V20676.A01

Date of Commencement of Construction or Modification: Planned for February 2022

Is any of the equipment to be leased to another individual or entity? ☐ Yes ☑ No

11. If necessary to preserve this source's status as a less-than-major source, the undersigned agrees that the permit or this source ***SHOULD*** ☑ ***SHOULD NOT*** ☐ include Federally Enforceable Provisions in accord with Code §3-1-084.

12. The undersigned states and certifies that, based on information and belief formed after reasonable inquiry, the statements and information in this document and supporting materials are true, accurate and complete. To the extent that this application pertains to an assignment of an existing permit, the undersigned further agrees to comply with and accept each and every obligation associated with that existing permit. *Knowingly presenting a false certification constitutes a criminal offense under A.R.S. §13-2704.*

13. The undersigned applicant states that he/she currently has, or at the time construction and/or operation begins will have, legal authority to enter upon and use the premises upon which this source will be operated.

14. Attach a description of the process to be permitted or revised including a list of equipment, capacities, MSDS sheets and anticipated production or throughput.

15. For new sources, an application filing deposit fee must be included with the application.

Maria Roberts

Signature of Responsible Official of Organization

Maria Roberts

Typed or Printed Name of Signer

Director, Coolidge Generating Station

Official Title of Signer

8/27/2021

Date

Pinal County Air Quality Control District

P.O. Box 987 – Florence, AZ 85132 P-(520) 866-6929 F-(520) 866-6967

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WIDE OPEN OPPORTUNITY

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   Billing Address (if different from above):
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3. Plant Name (if different from above): Coolidge Generating Station

4. Name(s) of Owner or Operator: Salt River Project Agricultural Improvement and Power District
   Phone:

5. Plant/Site Manager: Maria Roberts Phone: (602) 236-4328 Fax:

6. Contact Person: Zachary J Harbrin Phone: (602) 236-5779 Fax:
   Email Address: Zachary.Harbin@srpnet.com

7. Equipment/Plant Location or Proposed Location Address: 859 East Randolph Road
   City: Coolidge Zip: 85128 Parcel #: 503-34-015B
   Section/Township/Range:
   Latitude/Longitude: 32.55.01N, 111.30.15W Elevation: 1443

8. General Nature of Business: Electric generation
   Standard Industrial Classification Code: 4911

9. Type of Organization
   - ☐ Corporation State of Incorporation:
   - ☐ Arizona Limited Liability
   - ☐ Government Entity Government Facility Code:
   - ☐ Individual Owner
   - ☐ Partnership
   - ☑ Other (Specify): Agricultural Improvement District / Political Subdivision of the State of Arizona

10. Permit Application Basis: (Check all that apply)

- [ ] New Source
- [x] Permit Revision
- [ ] Administrative Change
- [ ] Renewal of Existing Permit
- [ ] Portable Source
- [ ] General Permit
- [ ] Permit Transfer

For renewal or modification, include existing permit number: V20676.A01

Date of Commencement of Construction or Modification: Planned for February 2022

Is any of the equipment to be leased to another individual or entity? [ ] Yes [x] No

11. If necessary to preserve this source's status as a less-than-major source, the undersigned agrees that the permit or this source ***SHOULD*** [x] ***SHOULD NOT*** [ ] include Federally Enforceable Provisions in accord with Code §3-1-084.

12. The undersigned states and certifies that, based on information and belief formed after reasonable inquiry, the statements and information in this document and supporting materials are true, accurate and complete. To the extent that this application pertains to an assignment of an existing permit, the undersigned further agrees to comply with and accept each and every obligation associated with that existing permit. *Knowingly presenting a false certification constitutes a criminal offense under A.R.S. §13-2704.*

13. The undersigned applicant states that he/she currently has, or at the time construction and/or operation begins will have, legal authority to enter upon and use the premises upon which this source will be operated.

14. Attach a description of the process to be permitted or revised including a list of equipment, capacities, MSDS sheets and anticipated production or throughput.

15. For new sources, an application filing deposit fee must be included with the application.

Maria Roberts

Signature of Responsible Official of Organization

Maria Roberts

Typed or Printed Name of Signer

Director, Coolidge Generating Station

Official Title of Signer

8/27/2021

Date

APPENDIX B

EMISSIONS CALCULATIONS

SRP Coolidge Generating Station

Table 1: Operating Scenario Inputs

Coolidge Generating Station Expansion Operating Parameters

Simple Cycle Aero	GE LM6000PC			
Number of Units	16			
Annual operations per turbine	1,000	Hours/year		
Annual utilization factor	11%			
SU/SD events, per GT	730	Number/year		Two per day
Start Duration	30	minutes		
Shutdown Duration	9	minutes		
Natural Gas (HHV)	1,015	Btu/cf		
Natural Gas (LHV)	914	Btu/cf		
Sulfur concentration in NG	0.25	gr/100 cf	0.001	lb of SO2/MMBtu
Annual average from fuel specification				
Lead Emission Factor	4.93E-07	lb/MMBtu		

Lead (Pb) emission factor is from the U.S. EPA's Compilation of Air Pollutant Emission

Table 2: Greenhouse Gas Emissions Factors

	CO2 (1)	CH4 (2)	N2O (3)	SF6 (4)		
Natural Gas (kg/MMBtu)	53.06	0.001	0.0001	NA	kg =	2.2046 lb
GWP	1	25	298	22800		
Natural Gas CO2e=	117.10 lb/MMBtu					
Natural Gas CO2=	116.98 lb/MMBtu					

Notes:
1. 40 CFR 98, Table C-1 (revised 11/29/13).
2. 40 CFR 98, Table C-2 (revised 11/29/13).
3. 40 CFR 98, Table A-1 (revised 11/29/13).
4. Sulfur hexafluoride (SF6) will be used as an insulating medium in circuit breakers.
The IEC standard for SF6 leakage is less than 0.5%; the NEMA leakage standard for new circuit breakers is 0.1%. A maximum leakage rate of 0.5% per year is assumed.

Table 3: **GE LM6000PC Aero Simple Cycle Unit Performance Normal Operation**

Output	49.5 MW															
Ambient Conditions																
Ambient Temperature	°F	10	10	10	59	59	59	59	59	59	102	102	102	102	102	102
Ambient Pressure	psia	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968
Ambient Relative Humidity	%	60	60	60	60	60	60	60	60	60	20	20	20	20	20	20
Gas Turbine																
GT Fuel Type		Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas
Number of Gas Turbines operating per Block		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GT load fraction	-	100%	75%	50%	100%	75%	50%	100%	75%	50%	100%	75%	50%	100%	75%	50%
Evap Cooler status		Off	Off	Off	On	On	On	Off	Off	Off	On	On	On	Off	Off	Off
SPRINT status		Off	Off	Off	On	On	Off	Off	Off	Off	On	On	Off	Off	Off	Off
Gas turbine water injection flow rate	klb/h	21.3	14.5	9.1	19	12	9.9	19.7	13.7	8.8	15.8	9.9	8.7	12.3	9.1	6.4
Plant Performance (not guaranteed)																
GT power (per GT)	kW	48269	36202	24135	49029	36772	24515	41985	31488	20992	45221	33916	22611	25507	19130	12753
GT Heat Cons (HHV)	MMBtu/h	471.3	376.1	285.2	489.8	385.8	288.4	424.3	341.4	263.1	456	363	274.2	298.2	250.6	205.8
SCR Exit Emissions (per unit)																
NOx Volume fraction, dry, at 15 % O2	ppm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
NOx mass flow rate (as NO2)	lb/h	4.3	3.4	2.6	4.4	3.5	2.6	3.8	3.1	2.4	4.1	3.3	2.5	2.7	2.3	1.9
CO Volume fraction, dry, at 15 % O2	ppm	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
CO mass flow rate	lb/h	7.3	5.8	4.4	7.6	6	4.5	6.5	5.3	4.1	7	5.6	4.2	4.6	3.9	3.2
VOC Volume fraction, dry, at 15 % O2	ppm	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
VOC mass flow rate (as methane)	lb/h	4.2	3.3	2.5	4.3	3.4	2.6	3.8	3	2.3	4	3.2	2.4	2.6	2.2	1.8
NH3 Volume fraction, dry, at 15 % O2	ppm	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
NH3 mass flow rate	lb/h	3.2	2.5	1.9	3.3	2.6	1.9	2.8	2.3	1.8	3.1	2.4	1.8	2	1.7	1.4
Total Particulates	lb/h	4.18	4.14	4.11	4.19	4.15	4.11	4.16	4.13	4.1	4.17	4.14	4.11	4.11	4.1	4.08
Stack CO2 mass flow rate, Including Pe	lb/h	57,900	46,300	35,100	60,200	47,400	35,500	52,200	42,000	32,400	56,100	44,700	33,800	36,900	30,900	25,400

Table 4: GE LM6000PC Aero Simple Cycle Unit Performance Startup and Shutdown

Event	Duration (min)	Heat Input (MMBTU - HHV)	NOx (lb)	CO (lb)	VOC (lb)	PM/PM10 /PM2.5 (lb)
Startup	30	199.6	14.3	15.7	1.8	**4.1**
Shutdown	9	33.7	3.9	16.6	0.9	**1**

SRP Coolidge Generating Station

Table 5: GE LM6000PC Aero Simple Cycle Unit Emissions

Operating Parameters	Operation (Hours/year)	Heat Input* (MMBtu/hr)
SC GT Operation	1,000	490

For simple cycle units SU&SD hours are in addition to the capacity factor

	SU&SD	
SC GT Operating Scenarios (events/year)	730	
SC GT Heat Input* for minimum load (MMBtu)	200	represents heat input for MECL for partial hour

Pollutants	One SC GT Emissions** Max Hourly (lb/hour)	Annual (tons/year)	Emissions SU&SD (tons/year)	Emissions Total for One CT (tons/year)
NOx	4.4	2.2	6.6	8.8
CO	7.6	3.8	11.8	15.6
VOC	4.3	2.2	1.0	3.1
SO2***	0.5	0.2	0.05	0.3
PM	4.2	2.1	1.9	4.0
PM10	4.2	2.1	1.9	4.0
PM2.5	4.2	2.1	1.9	4.0
H2SO4****	0.05	0.02	0.00	0.0
Lead	2.41E-04	0.000	0.000	0.0
CO2	57,295	28,647	5,539	34,187
CO2e	57,356	28,678	5,545	34,223

**Heat input in HHV representing maximum for cold ambient temperature case.*

***NOx, CO, VOC, PM/PM10/PM2.5 annual emissions based on the short term emission rate for 59 °F ambient temperature case.*

****SO_2 emission factor of 0.001 lb/MMBtu based on combustion of pipeline quality natural gas and assuming a maximum S concentration of 0.25 gr/100 cf.*

*****The sulfuric acid mist emissions are estimated as 10% of the SO_2 emissions.*

SRP Coolidge Generating Station

Table 6: Wet Surface Air Coolers Emissions

k Particle Size Multiplier*		
PM	PM10	PM2.5
100%	29.97%	0.18%

	WSAC	Q per Unit**	Q (total)	C_{TDS}	%DL	Emissions (lb/hour) (total)			Emissions (TPY) (total)***		
	Number	gal/min	gal/min	ppm	%	PM	PM10	PM2.5	PM	PM10	PM2.5
WSAC	7	10,600	74,200	5,000	0.0005%	0.93	0.28	0.002	0.46	0.14	0.001
Six cells per WSAC											

*PM10 and PM2.5 particle size multiplier from "Calculating Realistic PM10 Emissions from Cooling Towers"; Reisman & Frisbie (uses EPRI wet droplet size distribution).

**Q per WSAC engineering estimate.

*** Annual emissions based on the 1,000 hours per year for each unit.

WSAC PM emissions are calculated based on the maximum circulating water flow rate, the design total dissolved solids (TDS) for the circulating

$E = Q \times k \times (60\ \text{min/hr})\ (8.345\ \text{lb water/gal}) \times (C_{TDS}/1{,}000{,}000) \times (DL/100)$

Where,
- E = Particulate matter emissions, pounds per hour
- Q = Maximum circulating water flow rate, gallons per minute
- C_{TDS} = Circulating water total dissolved solids, parts per million (ppm)
- k = Particle Size Multiplier

SRP Coolidge Generating Station

Table 7: Emissions Summary

Coolidge Generating Station Summary of Emissions for All Units under the Expansion

	Number	Model
Simple Cycle Aero:	16	LM6000PC
Total Capacity:	792	MW

	Potential to Emit (tons/year)					
	Simple Cycle Turbines		WSAC	Total	PSD/NNSR MSS	
Pollutants	Normal	SU&SD			(tons/year)	Over MSS?
NOx	35.2	106.3		141.5	250	No
CO	60.8	188.6		249.4	250	No
VOC	34.4	15.8		50.2	250	No
SO2	3.9	0.8		4.7	250	No
PM	33.5	29.8	0.5	63.8	250	No
PM10	33.5	29.8	0.1	63.4	70	No
PM2.5	33.5	29.8	0.0	63.3	250	No
H2SO4	0.39	0.08		0.47	250	No
Lead	0.0019	3.73E-04		0.00	250	No
CO2	458,359	88,631		546,990	NA	
CO2e	458,845	88,725		547,569	NA	

APPENDIX B

SRP Modeling Report for Class I Title V Air Permit Application

AIR DISPERSION MODELING FOR THE PROPOSED EXPANSION OF THE COOLIDGE GENERATING STATION

Prepared for:
Salt River Project Agricultural Improvement and Power District
1521 N. Mill Avenue
Tempe, Arizona 85281

Prepared by:
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304-A West Millbrook Road
Raleigh, North Carolina 27609

September 2021

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the proposed expansion of the Coolidge Generating Station (Coolidge) owned and operated by the Salt River Project Agricultural Improvement and Power District (SRP) in Pinal County, Arizona.

The analysis evaluated emissions of each criteria pollutant that triggered minor New Source Review (NSR) as defined in R18-2-302 of the Arizona Administrative Code (AAC). The project will trigger minor NSR for all criteria pollutants except lead (Pb) and sulfur dioxide (SO_2). The criteria pollutant analysis was conducted to ensure that the proposed project will not cause or contribute to air pollution in violation of a National Ambient Air Quality Standard (NAAQS). Since the SRP Coolidge facility is located in an area of Pinal County which is classified as non-attainment for particulate matter with an aerodynamic diameter of less than 10 microns (PM10), the modeling analysis addressed the Arizona Department of Environmental Quality's (ADEQ) procedures for modeling demonstrations for both attainment and nonattainment pollutants.

The analysis conforms with the modeling procedures outlined in the U.S. Environmental Protection Agency's (EPA) Guideline on Air Quality Models[1] (Guideline), the ADEQ's Air Dispersion Modeling Guidelines for Arizona Air Quality Permits,[2] and associated EPA modeling policy and guidance. The modeling analysis also conforms with the modeling protocol submitted to the Pinal County Air Quality Control District (PCAQCD) on August 24, 2021. The PCAQCD subsequently requested revisions which have been addressed herein.

2.0 PROJECT DESCRIPTION

The proposed Coolidge expansion project involves the construction and operation of 16 new simple cycle aeroderivative combustion turbine generators (CTGs). In addition, the project includes addition of 7 wet surface air coolers (WSACs) for both the existing and the new CTGs. The project will result in potential emissions of carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOC), particulate matter with an aerodynamic diameter of less than 2.5 microns (PM2.5), and PM10 that are in excess of the minor NSR thresholds in R18-2-101(101). These pollutants are therefore subject to minor NSR review and were also conservatively evaluated for ambient impacts from the project using the air quality modeling analysis.[a]

[a] The proposed project is not subject to major NSR for any regulated NSR pollutant.

3.0 SITE DESCRIPTION

The Coolidge Generating Station is located in the City of Coolidge in Pinal County, approximately 16 kilometers (10 miles) southwest of Florence, Arizona. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 452,860 meters east and 3,642,300 meters north (UTM Zone 12, NAD 83). SRP currently operates 12 simple-cycle CTGs at this location. Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location.

The facility is approximately 427m (1400ft) above mean sea level. The portion of Pinal County where the facility is located is classified as attainment or unclassified for all criteria pollutants other than PM10, for which the area is classified as nonattainment.

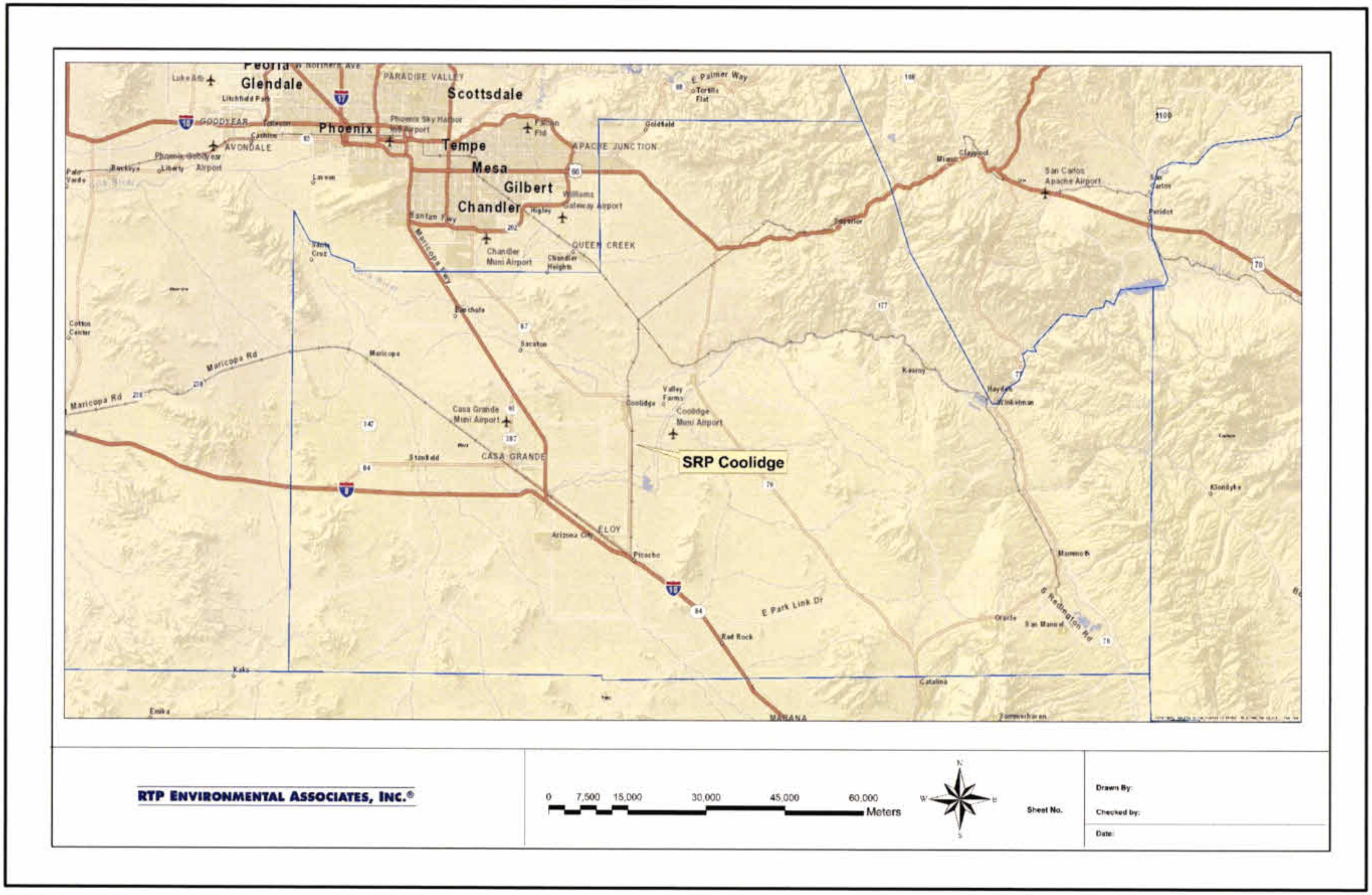


Figure 1. General Location of the SRP Coolidge Generating Station

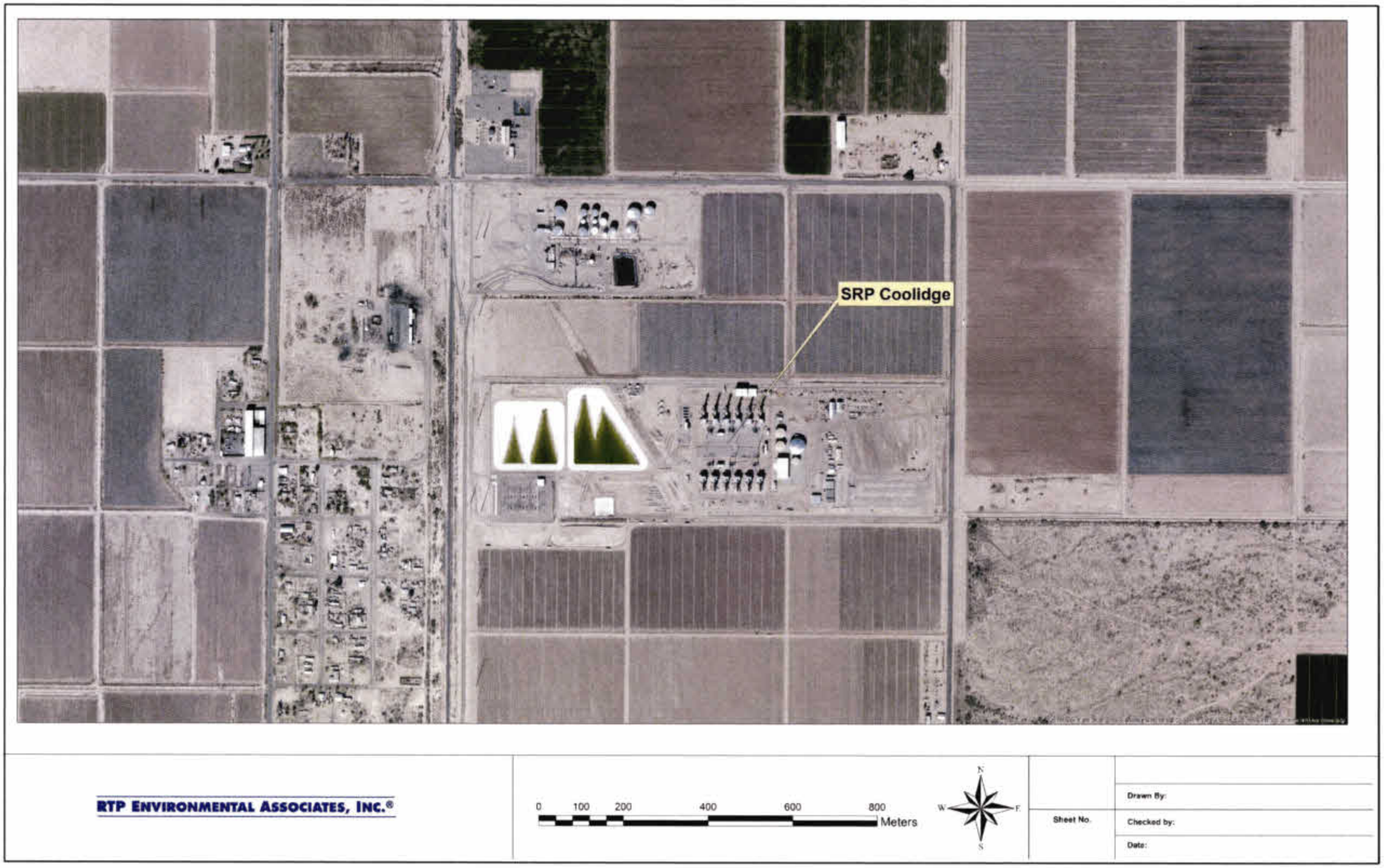


Figure 2. Specific Location of the SRP Coolidge Generating Station

4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 21112) was used to conduct the modeling analyses. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the most appropriate model for calculating ambient concentrations near the facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the Guideline.

Oris Solution's BEEST Graphical User Interface (GUI) was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, there is no need for a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W.

4.2 Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. The use of rural dispersion coefficients is supported by the

Land Use Procedure consistent with subsection 7.2.1.1.b.i of the Guideline and Section 5.1 of the AERMOD Implementation Guide. The USGS 2016 National Land Cover Data ("NLCD") within 3km of the site were converted to Auer 1978 land use types and evaluated.[3] It was determined that the land use in the vicinity of the facility is predominantly rural as defined by Auer (less than 50% of the area is classified as urban - Figure 3). Only the red and dark red regions in Figure 3 (NLCD categories 23 and 24) are considered urban. The potential for urban heat island effects, which are regional in character, was considered and determined not to be of concern.

4.3 Source Data

Source Characterization

Point Sources

Only point sources required evaluation. The existing turbines currently vent, and the new turbines will vent, to stacks with a well defined opening. The turbines were therefore modeled as point sources in AERMOD. The WSACs were also modeled as point sources. Each cell was modeled as a separate source. All source locations were based upon a NAD83, UTM Zone 12 projection. Attachment A provides the modeling input data.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice (GEP) stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for stacks to be constructed in excess of 65m. Procedures used were in accordance with those described in the EPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)4. GEP formula stack height, as defined in §3-1-177(B) of the PCAQCD Regulations, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from facility plot plans and aerial photos. The structure locations and

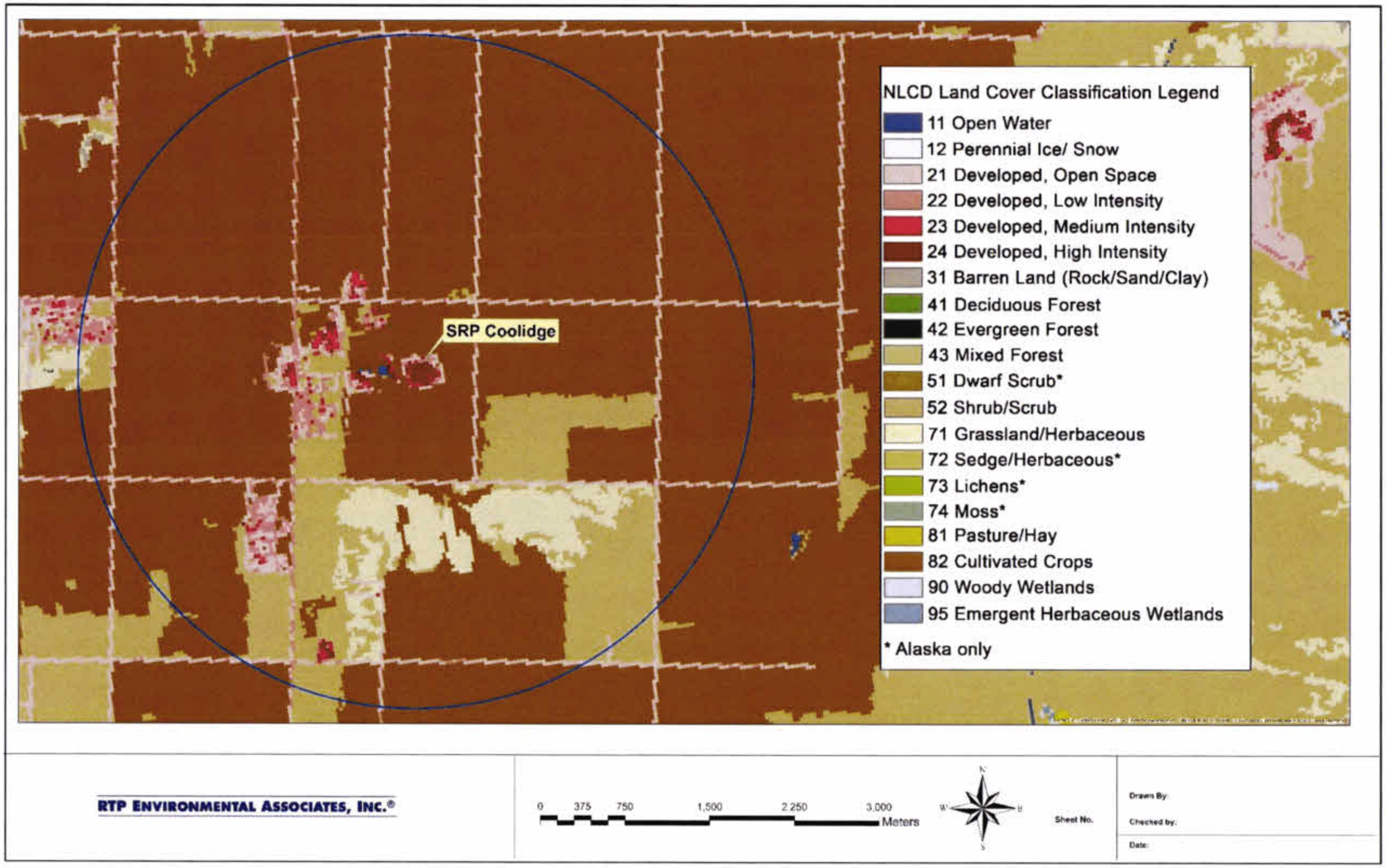


Figure 3. Land Use within Three Kilometers (3km Radius Shown)

heights were input to the EPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The proposed configuration of the facility is shown in Figure 4.

4.4 Monitored Background Data

Pursuant to ADEQ's Modeling Guidelines, background pollutant concentrations must be included in NAAQS analyses for both Prevention of Significant Deterioration (PSD) and non-PSD (minor NSR) applications. In general, the background concentrations are intended to account for sources not explicitly included in the modeling. The background concentrations are added to the modeled concentrations to assess NAAQS compliance.

The project requires modeling to assess NAAQS compliance for all regulated pollutants except SO_2 and lead. Even though the SRP Coolidge facility is in an area classified as nonattainment for PM10, the ADEQ's Modeling Guidelines allow for a facility to model facility-wide emissions and add the model results to representative background concentrations to demonstrate concentrations below the NAAQS. Background data are therefore needed for PM10, PM2.5, NO_2, CO and ozone.

There are existing ambient monitors within 100 miles of the facility (Figure 5). Existing monitoring data have been evaluated in relation to the criteria provided in EPA's Ambient Monitoring Guidelines[5] as being representative of the SRP Coolidge site.

Monitor Location

All proposed monitors, with the exception of Alamo Lake, are within 80 kilometers of the SRP facility. None of the selected monitors are subject to influence of any major, localized industry. All monitors therefore provide an adequate representation of the air quality in the vicinity of the SRP site.

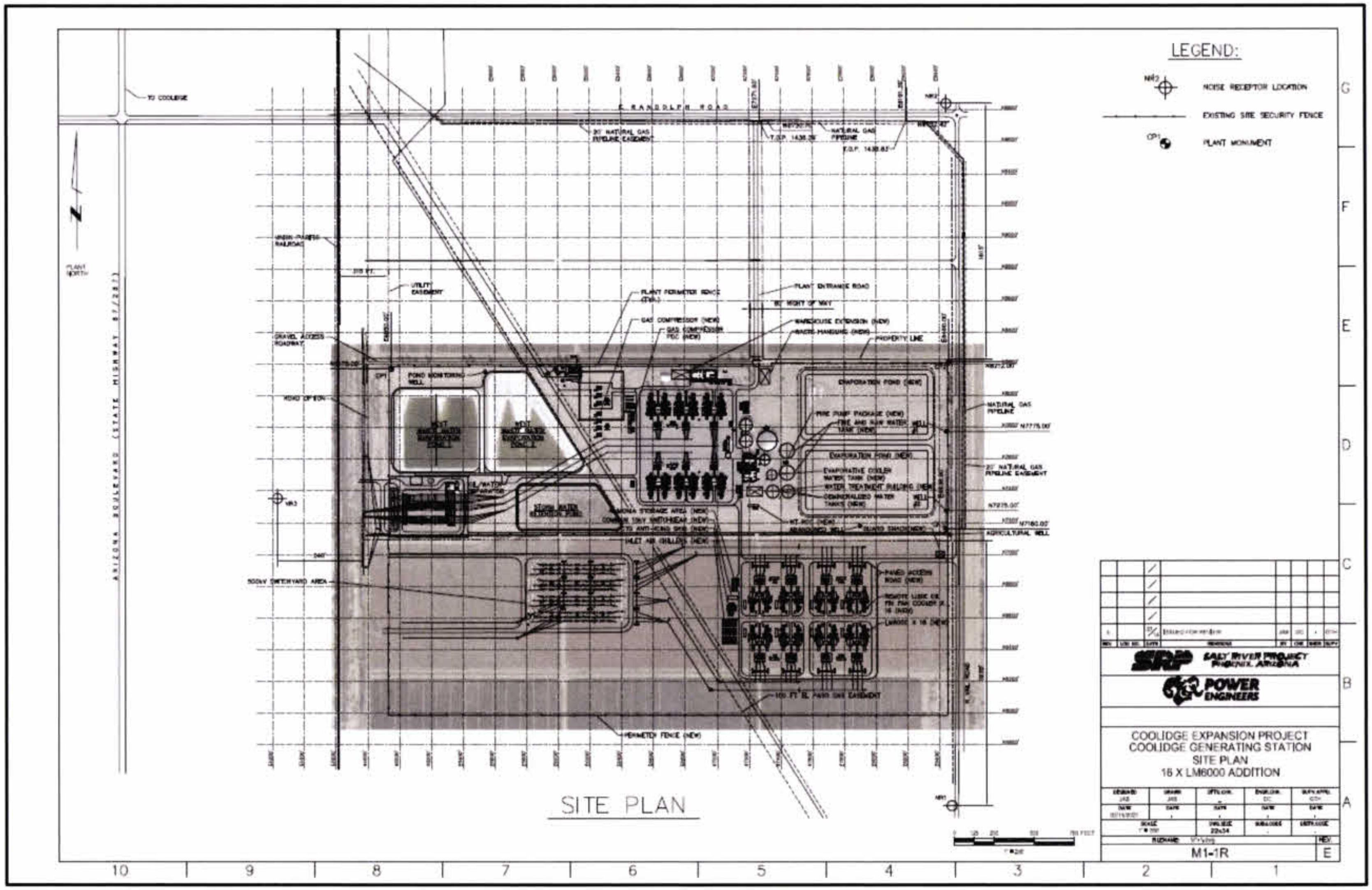


Figure 4. Preliminary SRP Coolidge Plot Plan

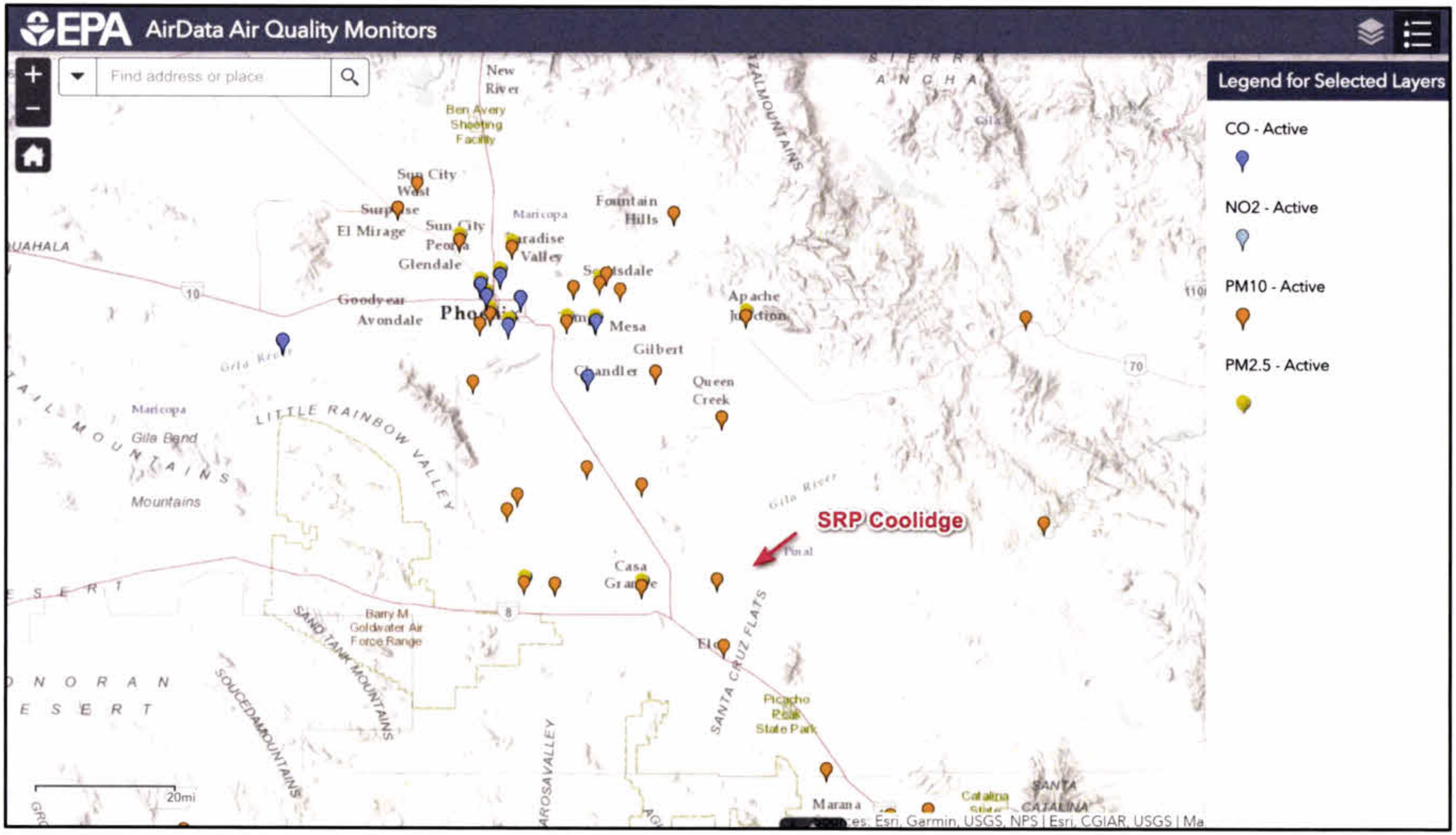


Figure 5. Ambient Monitors in the Vicinity of the SRP Coolidge Facility

There are very few active NO_2 monitors in Arizona and nearly all monitoring sites are located in the Phoenix/Tucson metropolitan areas. SRP has elected to conservatively include the annual NO_2 concentrations as measured in Tucson. While the climatology and topography of these metropolitan areas are representative of the SRP Coolidge location, the Tucson monitor is more influenced by localized emissions from vehicles. The annual NO_2 concentrations at Tucson are therefore likely higher than would be expected at the more rural Coolidge location. Use of the Tucson data should therefore be a conservatively high representation of the upper bound of annual NO_2 concentrations experienced at Coolidge.

In addition, SRP has elected to use the ADEQ recommended 26.3 $\mu g/m^3$ 1-hour background NO_2 concentration from Alamo Lake (see the ADEQ Modeling Guidance at Section 7.1.4 as updated based upon the September 7, 2021 email from PCAQCD to SRP). The ADEQ recommends this value for areas where local anthropogenic NOx sources are negligible. As previously stated, the Coolidge location is in a rural area, about midway between Phoenix and Tucson, in an area devoid of any significant localized NOx industrial sources or heavy vehicular traffic. The Alamo Lake data should therefore adequately represent concentrations at the SRP location.

Data Quality

The existing ambient monitors were established and air quality data were collected as part of EPA's ambient air quality monitoring network. Federal regulations at 40 CFR Part 58, Appendix A, require that these data meet quality assurance (QA) requirements. The existing ambient air quality data also meet the data quality requirements of Section 2.4.2 of the Monitoring Guidelines. The QA requirements for monitoring criteria pollutants at PSD sites are very similar to the QA requirements for monitoring sites for NAAQS compliance. The proposed monitoring data meet the data quality criterion.

Currentness of Data

The Monitoring Guidelines suggest that air quality monitoring data used to meet PSD data requirements should be "collected in the 3-year period preceding the permit application."[6] All data presented herein, with the exception of PM10, are current and meet this criterion. The PM10 monitor in Coolidge ceased operation at the end of 2019. Therefore, the most recent three-year period covers the 2017-2019 timeframe. These data, however, should still be representative of the concentrations in the Coolidge area. This is the closest monitor to the SRP site and there has been no significant residential or industrial growth in the area since 2019 that would significantly influence current PM10 concentrations in the area. The population in Pinal County decreased by approximately 37,000 in 2020 as compared to 2019.[7] Additionally, review of a list of issued air permits in Pinal County in 2019 and 2020 indicates that there were only two minor permit revisions, one at the Cactus Landfill in Florence and one at the Frito-Lay facility in Casa Grande. The only significant permit revision occurred at the SRP Desert Basin facility which is in excess of 15 miles from Coolidge.

The Coolidge monitor sampling frequency of once every six days is consistent with 40 CFR § 58.12(e). Among monitoring sites satisfying the requirements of 40 CFR part 58, sampling frequency is not a pertinent factor listed in the Monitoring Guidelines as a factor to be considered in evaluating whether the proposed monitoring data are representative. The background values are shown in Table 1.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR §50.1(e) and §1-3-140 of the PCAQCD Regulations. Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access.

The receptor grid consisted of four Cartesian grids and receptors spaced at 25m intervals along the facility fenceline (or process area boundary) (Figure 6). The first Cartesian grid extended to approximately 3km from the fence in all directions.

Table 1. Ambient Background Values (2018-2020)

Pollutant	Average	Background Value (μg/m³)	NAAQS (μg/m³)	Design Concentration	Monitor Name	Site ID
NO_2	Annual	15.5 (8.2ppb)	100 (53ppb)	Maximum of annual average from three years	Tucson	04-019-1028
	1-hr	26.3 (14.1ppb)	188 (100ppb)	Recently recommended ADEQ value.	Alamo Lake	Alamo Lake
CO	1-hr	1040 (0.91ppm)	40,000 (35ppm)	Highest concentration from past three years	Tucson	04-019-1028
	8-hr	812 (0.71ppm)	10,000 (9ppm)	Highest concentration from past three years		
Ozone	8-hr	137 (0.07 ppm)	137 (0.07 ppm)	Annual 4th high daily max 8-hr average from three years	Casa Grande	04-021-3003
PM2.5	Annual	7.19	12	Three year annual average	Casa Grande	04-021-3003
	24-hr	18.2	35	Average of the 98% 24hr values over three years		
PM10	24-hr	96.0	150	Three year average (2017-19) of 2nd high values.	Coolidge	04-021-3004

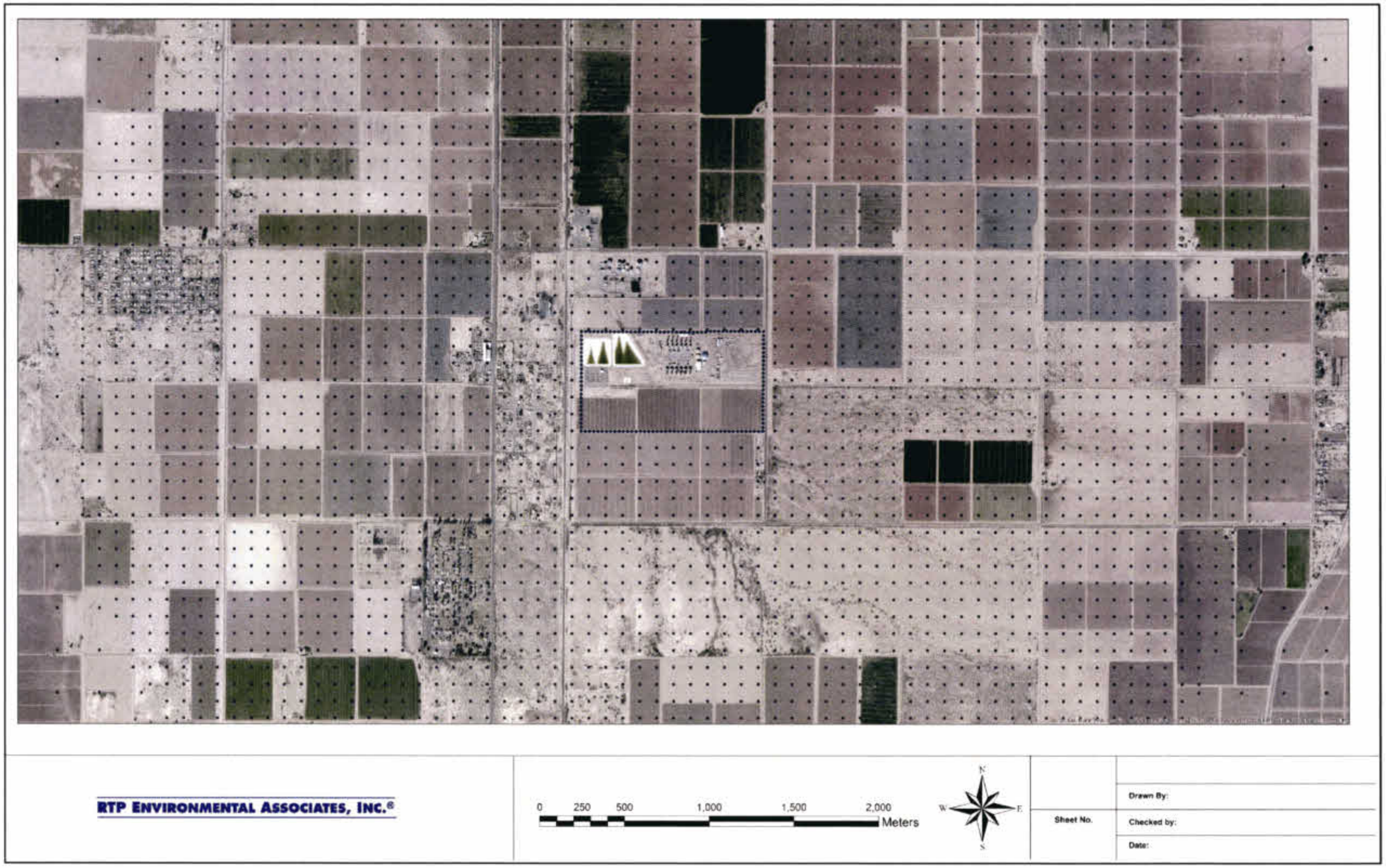


Figure 6. SRP Coolidge Near-field Receptor Grid

Receptors in this region were spaced at 100m intervals. The second Cartesian grid extended from 3km to 7.5km from the fenceline. Receptor spacing in this region was 250m. A third Cartesian grid was employed that extended from 7.5km to 10km from the fenceline. Receptor spacing in this region was 500m. A fourth grid extended from 10 to 25km with a spacing of 1000m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. Maximum impacts outside of the 3km grid, as were seen in the mountainous regions to the northwest and southeast, were refined to 100m. Additionally, impacts in excess of 90% of a standard were resolved to 25m.

The SRP Coolidge facility is located in southern Arizona. There is terrain in the vicinity of the facility which exceeds stack top elevation. Receptor elevations and hill height

scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS 1 arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 12 projection.

4.6 Meteorological Data

The 2014-2018, 5-year sequential hourly surface meteorological data collected at the Phoenix Sky Harbor International Airport (WBAN 23183) and upper air data from Tucson (WBAN 23160) were used in the analysis. These data were processed by ADEQ using AERMET version 19191. To address issues with model overprediction due to underprediction of the surface friction velocity (u*) during light wind, stable conditions, EPA integrated the ADJ_U* option into the AERMET processor. ADEQ used the ADJ_U* option in processing the data. ADEQ also employed 1-minute data using the AERMINUTE processor with a 0.5 m/sec wind speed threshold to minimize the number of calm wind conditions encountered when using Automated Surface Observing System (ASOS) data.

There are four criteria in the Guideline for assessing whether meteorological data are representative of the study area. These criteria include: 1) proximity of the meteorological station to the area under consideration, 2) the complexity of the terrain, 3) the exposure of the meteorolgical site, and 4) the period of time during which the data are collected. The Sky Harbor data have been evaluated relative to these criteria and determined to be representative of the Coolidge study area. Sky Harbor is located approximately 75km to the northwest of the SRP facility as shown in Figure 7. There are no significant terrain features between the two sites that would affect wind direction and thus significantly alter the dispersion patterns experienced at each location. The Sky Harbor tower is also free of any obstructions as it was established as a National Weather Service 1St Order Station that must meet specific site and exposure standards. In addition, the most current five year dataset as provided by the ADEQ was employed. As a result, the Phoenix data adequately represent the meteorological conditions experienced at the SRP Coolidge site. The 2014-2018 windrose is provided in Figure 8.

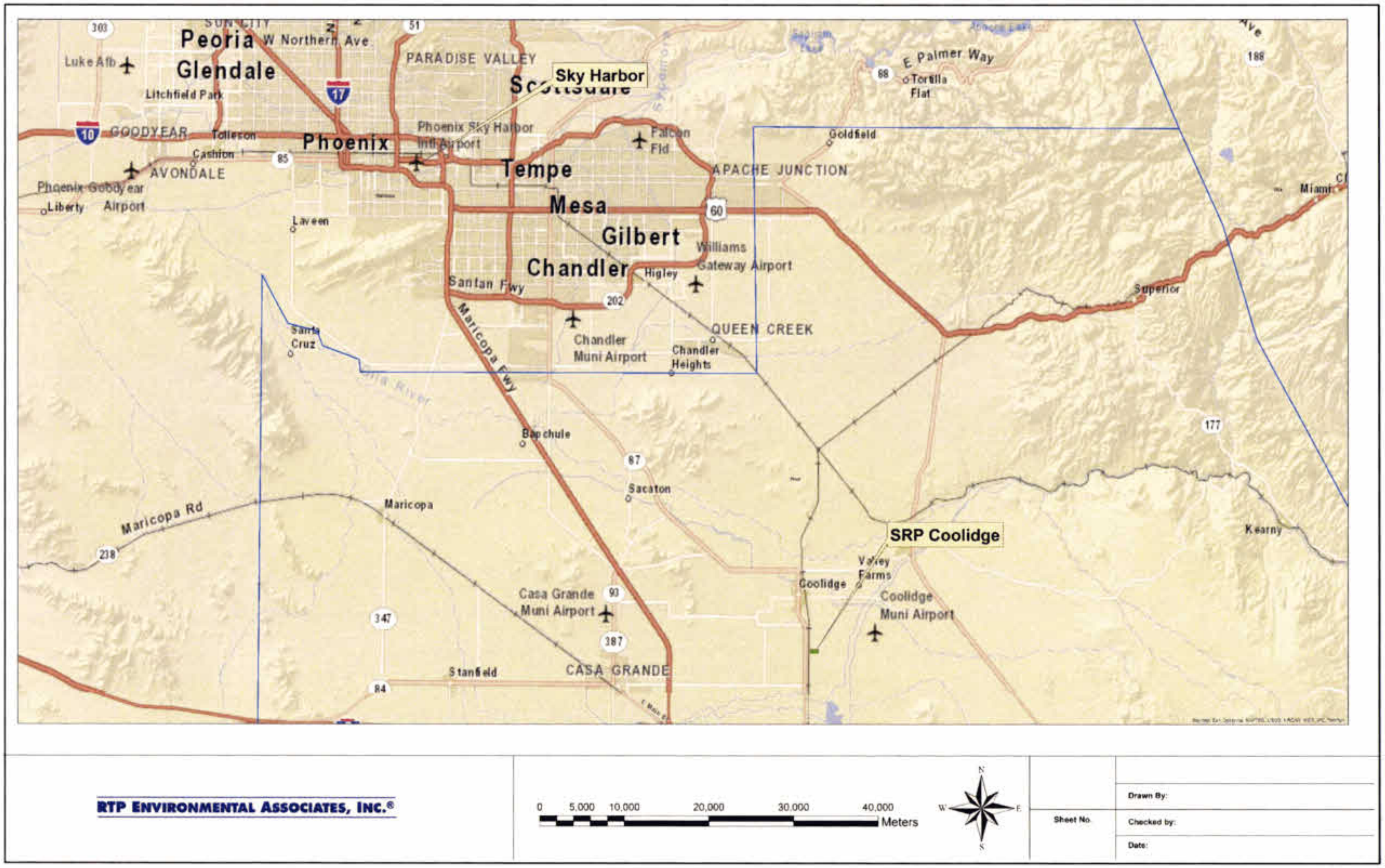
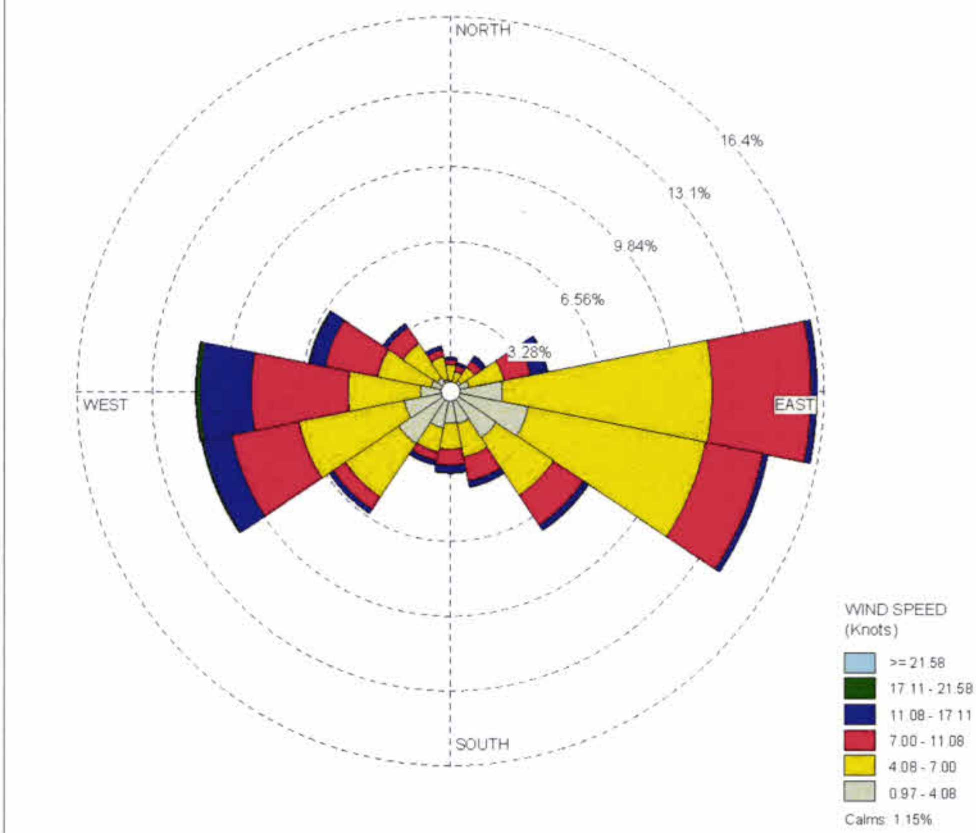


Figure 7. Location of the Phoenix Sky Harbor Airport Relative to the SRP Coolidge Facility

WIND ROSE PLOT:
Phoenix
2014-2018

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2014 - 00:00 **End Date: 12/31/2018 - 23:59**	**RTP Environmental**	
		MODELER: **David Keen**	RTP ENVIRONMENTAL ASSOCIATES, INC.®
	CALM WINDS: **1.15%**	TOTAL COUNT: **43573 hrs.**	
	AVG. WIND SPEED: **6.27 Knots**	DATE: **3/31/2021**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure 8. Phoenix Sky Harbor Windrose (2014-2018)

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

All criteria pollutants with emissions in excess of the minor NSR threshold were evaluated for NAAQS compliance. These pollutants include: NO_2, CO, PM2.5, PM10 and VOC (ozone).

5.2 Load/Operating Conditions and Facility Design

The turbine emission rates and stack parameters vary with the numerous combinations of operating load and ambient temperature. A load screening analysis was therefore performed to determine the operating conditions that result in the highest modeled impacts. Rather than model each of the potential combination of operating load and ambient temperature, a simplified, conservative analysis was performed by modeling the "worst-case" stack temperature and flow rate for multiple load conditions using the minimum value of flow and temperature at each load. For example, the turbine vendor provided stack gas conditions (i.e., gas release temperature and velocity) for five different ambient temperatures ranging from 10 to 102F for each of five operating scenarios (i.e., 100%, 75%, 50% load and start-up/shut-down). To simplify the analysis, the lowest gas exit temperature and velocity across the five different ambient conditions was modeled for each of the four operating scenarios. Because emissions are generally directly related to heat input rates, the emissions used for the four operating scenarios were be normalized based on the relative heat input at these four scenarions loads. Peak emission rates for the CTGs represent the maximum hour that includes startup for the first 30 minutes and normal operation for the remaining 30 minutes. Attachment A provides all load condition input values and the modeled parameters.

5.3 Significant Impact Analysis

The criteria pollutant air quality analysis, to demonstrate that the project will not cause or contribute to a NAAQS exceedance, was conducted in two phases: an initial or significant impact analysis, and a refined analysis if necessary. In the significant impacts analysis, the calculated maximum impacts were determined for each pollutant. These impacts were used to determine the net change in air quality resulting from the proposed project. Five years of Phoenix meteorological data were modeled. Maximum modeled concentrations were compared to the pollutant-specific significant impact levels for all pollutants and averaging times.

Pollutants with impacts that exceed the significant impact levels, as listed in Table 2, were evaluated for NAAQS compliance in a refined analysis

Pursuant to the ADEQ Modeling Guidelines, unlike methods used in NAAQS analyses for PSD permit applications, inclusion of regional or nearby sources under the minor NSR program is typically not required. However, SRP has conservatively included the adjacent Steel Girder, LLC/Stinger Bridge & Iron facility ("Stinger Welding") as a nearby source. The Stinger facility is located less than 0.5 km to the northwest of the SRP Coolidge facility. Given the proximity of the Stinger facility to the SRP Coolidge facility, it is possible that impacts from this source may not be adequately represented in the regional background concentrations. In the refined analysis, impacts from the SRP Coolidge facility and the nearby Stinger Welding facility were added to the regional background concentrations presented in Table 1. The resultant total concentrations were compared to the NAAQS.

The Western Emulsions facility is also located in close proximity to SRP (0.5km to the north). However, this facility only emits VOC and should not appreciably influence localized ozone concentrations in the vicinity of the SRP Coolidge facility.

5.4 Refined Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the NAAQS was conducted. A refined analysis was conducted to determine compliance with the NAAQS only for pollutants modeled as having significant impacts in the initial analysis. The five-year Phoenix meteorological dataset is again used in this analysis.

Table 2. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels (µg/m³)[a]
PM2.5	24-hour	1.2
	Annual	0.2
PM10	25-hour	5
NO_2	1-hour	7.5[b]
	Annual	1.0
CO	1-hour	2,000
	8-hour	500
Ozone	8-hour	1 ppb

[a] Unless otherwise noted, significance levels are codified at § 3-1-030 of the PCAQCD Regulations.
[b] There is no 1-hr NO_2 significance level promulgated in the federal or PCAQCD regulations. An interim 1-hr NO_2 significance level of 4 ppb (7.5 µg/m³) will be used as the 1-hr NO_2 significance level.

The modeled design concentrations were added to the monitored values presented in Table 1 to assess compliance with the NAAQS. The form of the design concentration and the NAAQS are shown in Table 3.

5.5 NO₂ Analyses

Following EPA guidance, the NO_2 modeling analyses used the recommended three tier screening approach. Initially, Tier 1 was employed with the conservative assumption that 100% of the available NOx converts to NO_2. Since the NO_2 impacts under this assumption exceeded the SILs, the Tier 2 (Ambient Ratio Method, or ARM2) was employed with the EPA recommended minimum and maximum ambient NO2/NOx ratios of 0.5 and 0.9, respectively. Tier 3, which accounts for the chemical reactions that convert NOx to NO_2 in the presence of ozone, was not employed.

5.6 Secondary PM2.5 Analyses

On February 10, 2020, the EPA issued draft guidance for assessing ozone and fine particulate matter modeling.[8] The guidance addresses both primary and secondary PM2.5 impacts. Primary PM2.5 impacts refer to the impacts due to direct emissions of PM2.5. Secondary impacts refer to the PM2.5 impacts attributable to nitrates and sulfates formed due to precursor NO_2 and SO_2 emissions. The EPA outlines four cases

Table 3. Modeled Design Concentration and NAAQS

Pollutant	Averaging Time	Modeled Design Concentration (μg/m^3)	Ambient Air Quality Standards (μg/m^3)[a]	
			Primary	Secondary
PM2.5	24-hour	Highest of multi-year averages of the 98th percentile of the annual distribution of 24-hour concentrations predicted each year at each receptor	35	35
	Annual	Highest of multi-year averages of annual concentrations at each receptor	12	15
PM10	24-hour	Highest, sixth highest 24-hour modeled concentration that occurred at each receptor over that five-year period	150	
NO_2	1-hour	Highest of multi-year averages of the 98th percentile of the annual distribution of maximum daily 1-hour concentrations predicted each year at each receptor	188	--
	Annual	Highest modeled concentration over the entire receptor network	100	100
CO	1-hour	Highest, second highest concentrations over the entire receptor network for each year modeled	40,000	--
	8-hour	Highest, second highest concentrations over the entire receptor network for each year modeled	10,000	--

[a] 40 CFR part 50.

for assessing the primary and secondary PM2.5 impacts. The appropriate case to use depends on the magnitude of direct PM2.5 and precursor NO_2 and SO_2 emissions. Case 1 is applicable if the emissions increase of both direct PM2.5 and secondary NO_2 and SO_2 emissions are below the PSD significant emission rates (SER). Case 2 is applicable if the direct PM2.5 emissions increase is greater than the SER and the NOx and/or SO2 emissions increase is less than the respective SER. Case 3 is applicable if both the direct PM2.5 and NOx and/or SO_2 emissions are greater than the SER. Case 4 is applicable to direct PM2.5 emissions of less than the SER and NOx and/or SO_2 emissions in excess of the SER. While Case 2 is technically not applicable to the Coolidge expansion project because the PM2.5 emissions increase is less than the SER, SRP modeled the direct PM2.5 emissions and compared the results to the significant impact levels. Secondary PM2.5 impacts were not assessed since precursor NO_2 and SO_2 emissions are less than the SER.

5.7 Ozone Analysis

Currently, there are no regulatory photochemical models available to evaluate smaller spatial scales or single-source impacts on ozone concentrations. Since ozone is formed from precursor pollutants, assessment of ambient ozone impacts is typically conducted on a regional basis using resource-intensive models, such as the EPA's Community Multiscale Air Quality (CMAQ) model. However, sources subject to PSD review are required to conduct a source impact analysis and demonstrate that a proposed source will not cause or contribute to a violation of any NAAQS or applicable increment. Qualitative ozone analyses typically have been performed in recent PSD applications to evaluate whether ozone precursor emissions (NO_X and VOC) will significantly impact regional ozone formation.

While VOC and NOx emissions increases associated with the project are less than the PSD SERs, the project's ozone precursor emissions were evaluated under the EPA's Modeled Emission Rates for Precursors (MERPs) guidance to demonstrate that the Project will not result in quantifiable ozone formation. SRP has evaluated Source No.

4007 from Gila County under the EPA's ozone MERPs guidance. Since the proposed VOC and NOx emissions increase from the SRP project are less than the MERP values for source 4007, SRP concludes that the proposed Coolidge expansion project will not cause or contribute to a violation of the NAAQS for ozone. No additional ozone impacts analysis was therefore conducted.

5.8 Modeling for HAPs Sources – Learning Sites Policy

ADEQ has established the Learning Sites Policy to ensure that children at learning sites are protected from criteria air pollutants as well as hazardous air pollutants (HAPs). Learning sites consist of all existing public schools, charter schools, and private schools at the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. Any facility located within 2 miles of a learning site is subject to the policy and must submit a modeling analysis to demonstrate compliance with the NAAQS and acute/chronic ambient air concentrations for listed air toxics. The closest schools to the SRP Coolidge facility are the Mary C O'Brien Elementary School and the West Elementary School. Both schools are located in excess of 4 miles from the SRP Coolidge facility. Therefore, no additional modeling was conducted pursuant to the Learning Sites Policy.

6.0 MODEL RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are provided electronically.

6.1 Load Analysis Results

The results of the load analysis can be found in Attachment B. The startup load condition was found to cause the highest impacts for all turbines for all averaging periods. The emissions and stack parameters associated with this load condition were therefore conservatively used in the remainder of the analysis. The startup emissions were not excluded from the significant impact or 1-hr NO_2 NAAQS demonstration.

6.2 Significant Impact Analysis Results

The project resulted in significant impacts for PM10, PM2.5, and NO_2 (Table 4). Based upon the results of the significant impacts analysis, a cumulative analysis was conducted to assess compliance with the NAAQS.

Table 4. Significant Impact Analysis Results

Pollutant	Avg Period	Maximum Modeled Impact - ($\mu g/m^3$)	PSD Significant Impact Level ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
NO_2	1-hr	71.3	7.5	25
	Annual	2.25	1.0	1.4
CO	1-hr	116	2,000	NA
	8-hr	45.8	500	NA
PM2.5	24-hr	4.37	1.2	21.1
	Annual	0.85	0.20	15.9
PM10	24-hr	5.62	5	0.79
SO_2	1-hr	2.40	7.8	NA
	3-hr	1.49	25	NA

NA- not applicable. Pollutant impact less than the SIL.

6.3 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the NO_2, PM10 and PM2.5 NAAQS. The adjacent Stinger Welding facility was included in the model and background concentrations were added to the model results to assess compliance. Evaluation of compliance with the 1-hr NO_2 NAAQS was based on the 98th percentile of the annual distribution of daily maximum 1-hour concentrations. Evaluation of compliance with the 24-hr PM2.5 NAAQS was based on the 98th percentile of the annual distribution of maximum 24-hour concentrations. Compliance with the PM10 24-hr standard was based upon the sixth highest value over the five-year meteorological period. Annual PM2.5 NAAQS compliance was evaluated based upon the average of the five-year modeled annual concentrations.

The results of the NAAQS analysis are presented in Table 5. As can be seen, the model demonstrates compliance. Summary model output can be found in Attachment B.

Table 5. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	Standard (µg/m³)
NO_2	1-hour	104	26.3	130	188
	Annual	3.70	15.5	19.2	100
PM2.5	24-hour	3.69	18.2	21.9	35
	Annual	1.78	7.19	8.97	12
PM10	24-hour	41.1	96.0	137	150

ATTACHMENT A
MODEL INPUT DATA

Load Screen Analysis Input for GE LM6000PC Aeroderivative Combustion Turbines with SCR and Oxidation Catalyst

1. Stack Conditions

Simple Cycle Units			Ambient	Inlet		Stack Temp (F)			Stack Velocity (ft/s)		
Condition	Category	Model	Temp (F)	Conditioning	Load -->	100%	75%	50%	100%	75%	50%
GEA-1	Aero	LMS6000PC	10	No		767	712	656	112.00	96.00	80.00
GEA-2	Aero	LMS6000PC	59	Yes		780	777	745	120.00	97.00	82.00
GEA-3	Aero	LMS6000PC	59	No		780	780	750	109.00	91.00	76.00
GEA-4	Aero	LMS6000PC	102	Yes		780	780	780	116.00	96.00	79.00
GEA-5	Aero	LMS6000PC	102	No		780	780	780	87.00	76.00	67.00

Startup represents average for the duration of unit startup.

2. Emission Rates

	Ambient	Inlet		PM(f+c) (lb/hr)				NOx (lb/hr)				CO (lb/hr)			
Condition	Temp (F)	Conditioning	Load -->	100%	75%	50%	Startup	100%	75%	50%	Startup	100%	75%	50%	Shutdown
GEA-1	10	No		4.18	4.14	4.11	6.19	4.30	3.40	2.60	16.45	7.30	5.80	4.40	22.81
GEA-2	59	Yes		4.19	4.15	4.11	6.20	4.40	3.50	2.60	16.50	7.60	6.00	4.50	23.06
GEA-3	59	No		4.16	4.13	4.10	6.18	3.80	3.10	2.40	16.20	6.50	5.30	4.10	22.13
GEA-4	102	Yes		4.17	4.14	4.11	6.19	4.10	3.30	2.50	16.35	7.00	5.60	4.20	22.55
GEA-5	102	No		4.11	4.00	4.08	6.16	2.70	2.30	1.90	15.65	4.60	3.90	3.20	20.51

For startup PM and NOx, use the GE information for startup plus 30 min of normal operation max load hourly emissions for that temperature condition.
For CO shutdown was worst case. Used 51 min of normal CO peak hourly emissions plust shutdown emission rate.

condition	emission ratios relative to 100% load										
GEA-1	0.99	0.98	1.48	1.00	0.79	0.60	3.83	1.00	0.79	0.60	3.12
GEA-2	0.99	0.98	1.48	2.00	0.80	0.59	3.75	2.00	0.79	0.59	3.03
GEA-3	0.99	0.99	1.49	3.00	0.82	0.63	4.26	3.00	0.82	0.63	3.40
GEA-4	0.99	0.99	1.48	4.00	0.80	0.61	3.99	4.00	0.80	0.60	3.22
GEA-5	0.97	0.99	1.50	5.00	0.85	0.70	5.80	5.00	0.85	0.70	4.46
max	0.99	0.99	1.50	1.00	0.85	0.70	5.80	1.00	0.85	0.70	4.46
min	0.97	0.98	1.48	1.00	0.79	0.59	3.75	1.00	0.79	0.59	3.03
avg	0.99	0.99	1.49	1.00	0.81	0.63	4.32	1.00	0.81	0.62	3.45

Rather than model each of the 20 combinations of stack and ambient temperatures and loads for each turbine load condition, a simplified yet conservative analysis was performed by modeling "worst-case" stack temperatures and flow rates over ambient temperatures for each load. The the minimum stack gas temperature and velocity and maximum emission rate across the ambient conditions were modeled for each load. Because emissions are directly related to heat input rates, the emissions used for the three load scenarios were normalized to values of 1.0, 0.85, 0.70, and 5.8 based on the relative heat input at these four loads (100%, 75%, 50% and startup).

Modeled Load Parameters

Source ID	Source Description	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Unit (lb/hr)
GE_100	GE LM6000 100% Load	767	87.0	11	1.00
GE_75	GE LM6000 75% Load	712	76.0	11	0.85
GE_50	GE LM6000 50% Load	656	67.0	11	0.70
GE_SU	GE LM6000 Startup	656	67.0	11	5.80

SRP Coolidge Turbine Load/Ambient Temp. Screening Model Input (NAD83, Zone 12)
Updated (5-27-21)

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Unit (lb/hr)
GE_100	GE LM6000 100% Load	453173.75	3641882.99	1444.5	85	767.0	87.0	11	1.00
GE_75	GE LM6000 75% Load	453173.75	3641882.99	1444.5	85	712.0	76.0	11	0.85
GE_50	GE LM6000 50% Load	453173.75	3641882.99	1444.5	85	656.0	67.0	11	0.70
GE_SU	GE LM6000 Startup	453173.75	3641882.99	1444.5	85	656.0	67.0	11	5.80

Load conditions are reflective of worst case (lowest) temperature and velocity and worst case emission rate (highest) for each turbine across all ambient conditions.

SRP Coolidge Model Input (NAD83, Zone 12)
Updated (7-26-21)

Source ID		Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	NO2 (lb/hr)	NOx (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	SOx (lb/hr)
GE1	DEFAULT	Existing GE LM6000 Turbine 1	452862.09	3642324.87	1442.5	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE2	DEFAULT	Existing GE LM6000 Turbine 2	452888.79	3642324.58	1442.6	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE3	DEFAULT	Existing GE LM6000 Turbine 3	452915.97	3642324.44	1442.6	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE4	DEFAULT	Existing GE LM6000 Turbine 4	452942.88	3642324.44	1442.8	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE5	DEFAULT	Existing GE LM6000 Turbine 5	452969.78	3642324.58	1442.9	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE6	DEFAULT	Existing GE LM6000 Turbine 6	452996.68	3642324.30	1443.2	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE7	DEFAULT	Existing GE LM6000 Turbine 7	452861.28	3642133.99	1443.8	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE8	DEFAULT	Existing GE LM6000 Turbine 8	452888.17	3642133.99	1443.9	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE9	DEFAULT	Existing GE LM6000 Turbine 9	452915.06	3642133.99	1444.0	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE10	DEFAULT	Existing GE LM6000 Turbine 10	452942.53	3642133.99	1444.3	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE11	DEFAULT	Existing GE LM6000 Turbine 11	452968.83	3642133.99	1444.5	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE12	DEFAULT	Existing GE LM6000 Turbine 12	452995.72	3642133.41	1444.7	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE13	DEFAULT	Proposed GE LM6000 Turbine 1	453046.11	3641911.65	1446.0	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE14	DEFAULT	Proposed GE LM6000 Turbine 2	453075.57	3641911.00	1446.1	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE15	DEFAULT	Proposed GE LM6000 Turbine 3	453105.74	3641910.65	1446.3	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE16	DEFAULT	Proposed GE LM6000 Turbine 4	453135.17	3641909.87	1446.4	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE17	DEFAULT	Proposed GE LM6000 Turbine 5	453174.32	3641908.93	1446.7	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE18	DEFAULT	Proposed GE LM6000 Turbine 6	453203.14	3641909.50	1447.0	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE19	DEFAULT	Proposed GE LM6000 Turbine 7	453233.68	3641908.64	1447.4	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE20	DEFAULT	Proposed GE LM6000 Turbine 8	453263.08	3641908.35	1447.8	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE21	DEFAULT	Proposed GE LM6000 Turbine 9	453045.52	3641885.01	1446.1	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE22	DEFAULT	Proposed GE LM6000 Turbine 10	453074.91	3641884.14	1446.3	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE23	DEFAULT	Proposed GE LM6000 Turbine 11	453105.22	3641884.02	1446.4	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE24	DEFAULT	Proposed GE LM6000 Turbine 12	453134.84	3641883.57	1446.5	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE25	DEFAULT	Proposed GE LM6000 Turbine 13	453173.75	3641882.99	1446.9	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE26	DEFAULT	Proposed GE LM6000 Turbine 14	453202.85	3641882.41	1447.3	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE27	DEFAULT	Proposed GE LM6000 Turbine 15	453233.40	3641881.84	1447.7	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE28	DEFAULT	Proposed GE LM6000 Turbine 16	453262.90	3641881.46	1448.1	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
CT1_CELL1	DEFAULT	Proposed Cooling Tower	452784.29	3642198.70	1443.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL2	DEFAULT	Proposed Cooling Tower	452800.48	3642198.57	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL3	DEFAULT	Proposed Cooling Tower	452792.13	3642198.32	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL4	DEFAULT	Proposed Cooling Tower	452806.91	3642198.32	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL5	DEFAULT	Proposed Cooling Tower	452814.49	3642198.45	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL6	DEFAULT	Proposed Cooling Tower	452821.43	3642198.06	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL1	DEFAULT	Proposed Cooling Tower	452783.87	3642181.46	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL2	DEFAULT	Proposed Cooling Tower	452791.82	3642181.27	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL3	DEFAULT	Proposed Cooling Tower	452800.49	3642181.21	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL4	DEFAULT	Proposed Cooling Tower	452806.76	3642181.08	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0

Source ID		Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	NO2 (lb/hr)	NOx (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	SOx (lb/hr)
CT2_CELL5	DEFAULT	Proposed Cooling Tower	452814.66	3642180.82	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL6	DEFAULT	Proposed Cooling Tower	452821.64	3642180.62	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL1	DEFAULT	Proposed Cooling Tower	453079.27	3642293.06	1443.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL2	DEFAULT	Proposed Cooling Tower	453092.41	3642293.25	1444.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL3	DEFAULT	Proposed Cooling Tower	453086.41	3642292.87	1443.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL4	DEFAULT	Proposed Cooling Tower	453115.32	3642292.87	1444.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL5	DEFAULT	Proposed Cooling Tower	453107.06	3642292.69	1444.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL6	DEFAULT	Proposed Cooling Tower	453100.30	3642292.31	1444.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641883.61	1449.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641883.77	1449.5	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641883.77	1449.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641874.43	1450.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641874.18	1449.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641874.49	1449.7	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641858.61	1449.4	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641858.77	1449.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641858.77	1449.7	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641849.43	1450.4	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641849.18	1450.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641849.49	1450.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641833.61	1449.6	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641833.77	1450.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641833.77	1449.8	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641824.43	1450.5	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641824.18	1450.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641824.49	1450.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641808.61	1449.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641808.77	1450.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641808.77	1450.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641799.43	1450.6	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641799.18	1450.4	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641799.49	1450.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0

SRP Coolidge Off-Site Source Input Data - (NAD83, Zone 12)

Model Source No.	Source ID	Source Description	Easting (X)	Northing (Y)	Base Elevation (ft)	Release Height (ft)	Horizontal Dimension - Sigma Y (ft)	Vertical Dimension - Sigma Z (ft)	Emissions (lb/hr)						
									NO2 (lb/hr)	NOx (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	SOx (lb/hr)
71	STING	Stinger Welding	452145.00	3642683.00	1440.2	35.0	85.4	32.6	1.44E-01	1.44E-01	1.39E-01	1.39E+00	3.20E-02	8.00E-03	8.00E-03

Stinger Welding is a minor source. Short term emission rates were calculated from actual emissions from 2018-19. 2500 hr/yr operation was assumed.

Annual emissions were not provided for PM2.5. PM2.5 emissions were assumed equal to 10% of PM10 emissions based upon AP-41, Table 13.2.6-1.

Stinger Welding Volume Source Parameter Calculation

		Source Dimensions					Initial Dispersion Coefficients		
Source ID	Source Description	Length (ft)	Width (ft)	Square Root of Area (ft)	Structure Height/Vertical Dimension (ft)	Release Height (ft)	Initial Horizontal Dimension s_Y (ft)	Initial Vertical Dimension s_Z (ft)	Note
STING	Stinger Welding	600.00	225.00	367.42	70.00	35.00	85.45	32.56	Elevated source on or adjacent to building

Sigma Y values calculated as the square root of the area, or average length of side, divided by 4.3 (Table 3-1 of AERMOD Manual for Single Volume Source).

Sigma Z values for surface based sources calculated as the initial vertical dimension of source divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Sigma Z values for elevated sources on or adjacent to a building calculated as the building height divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source on or Adjacent to Building).

Sigma Z values for elevated sources not on or adjacent to a building calculated as the initial vertical dimension of source divided by 4.3 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Release height equal to center of volume, or 1/2 vertical dimension.

ATTACHMENT B
MODEL RESULTS

SRP Coolidge Load Analysis Results (8-10-21)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.26639	465264.13	3635389.44	587.87	784.3		0 17110923	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.2557	466364.13	3636089.44	593.36	784.3		0 15112321	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.25465	438372.54	3646971.38	583.36	688.35		0 14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.25134	438272.54	3650071.38	594.49	836.73		0 16012201	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.24083	438672.54	3647971.38	574.36	688.35		0 18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.22092	438472.54	3646871.38	566.28	688.35		0 14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.22074	466364.13	3636189.44	579.47	784.3		0 17061323	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.21871	438472.54	3646871.38	566.28	688.35		0 15110804	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.21846	438672.54	3647971.38	574.36	688.35		0 18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.21736	453800	3641900	443.74	443.74		0 16031202	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.24761	465264.13	3635489.44	584.15	784.3		0 17110923	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.23826	438372.54	3646971.38	583.36	688.35		0 14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.23742	438672.54	3647971.38	574.36	688.35		0 18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.23705	464964.13	3631689.44	580.38	733.94		0 15012724	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.22793	437172.54	3650371.38	584.61	836.73		0 16012201	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.83046	438472.54	3646871.38	566.28	688.35		0 14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.82903	466364.13	3636189.44	579.47	784.3		0 17061323	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.81214	438472.54	3646871.38	566.28	688.35		0 15110804	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.81011	438672.54	3647971.38	574.36	688.35		0 18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.80096	453800	3641900	443.74	443.74		0 16031202	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.04146	453700	3641900	443.46	443.46		0 18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.04086	453700	3642000	443.5	443.5		0 17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.0408	453600	3642200	443.07	443.07		0 16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.03853	452679.24	3641720.18	440.45	440.45		0 14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.03675	453700	3641900	443.46	443.46		0 15070224	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03852	453600	3641900	443.08	443.08		0 18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03711	453600	3642200	443.07	443.07		0 16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03701	453700	3642000	443.5	443.5		0 17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03453	452679.24	3641720.18	440.45	440.45		0 14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03412	453600	3641800	443.07	443.07		0 15062624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.04073	453600	3641900	443.08	443.08		0 18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03968	453700	3642000	443.5	443.5		0 17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03963	453600	3642200	443.07	443.07		0 16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03723	452679.24	3641720.18	440.45	440.45		0 14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03585	453600	3641800	443.07	443.07		0 15062624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.31918	453600	3641900	443.08	443.08		0 18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.30751	453600	3642200	443.07	443.07		0 16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.30662	453700	3642000	443.5	443.5		0 17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.28614	452679.24	3641720.18	440.45	440.45		0 14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.28269	453600	3641800	443.07	443.07		0 15062624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.15189	438272.54	3650071.38	594.49	836.73		0 16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.13836	453700	3641800	443.46	443.46		0 18072612	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.13806	452600	3641700	440.36	440.36		0 15030612	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.13752	437072.54	3650371.38	586.39	836.73		0 14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.12979	452700	3641600	440.66	440.66		0 17030215	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.13056	438272.54	3649671.38	566.65	836.73		0 16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.12573	438572.54	3647271.38	560.49	688.35		0 15112624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.12264	452700	3641700	440.51	440.51		0 18101912	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.12219	438172.54	3649571.38	565.77	836.73		0 14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.11819	452679.24	3641720.18	440.45	440.45		0 17121012	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.1423	438272.54	3649671.38	566.65	836.73		0 16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.13397	438572.54	3647271.38	560.49	688.35		0 15112624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.13323	453700	3641800	443.46	443.46		0 18072612	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.12912	438172.54	3649571.38	565.77	836.73		0 14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.12514	452679.24	3641720.18	440.45	440.45		0 17121012	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.08178	438272.54	3649671.38	566.65	836.73		0 16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.04178	438572.54	3647271.38	560.49	688.35		0 15112624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.01613	452700	3641700	440.51	440.51		0 18101912	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.01247	438172.54	3649571.38	565.77	836.73		0 14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_SU	1ST	0.97929	452679.24	3641720.18	440.45	440.45		0 17121012	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.10218	453700	3641800	443.46	443.46		0 18072616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.10158	452700	3641700	440.51	440.51		0 15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.10123	453600	3642200	443.07	443.07		0 16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.09668	453700	3642000	443.5	443.5		0 17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.08904	452654.27	3641720.46	440.4	440.4		0 14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.09302	452700	3641700	440.51	440.51		0 18012916	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.091	452700	3641700	440.51	440.51		0 15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.09042	453600	3642200	443.07	443.07		0 16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.08636	453700	3642000	443.5	443.5		0 17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.07762	452679.24	3641720.18	440.45	440.45		0 14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.0989	453700	3641800	443.46	443.46		0 18072616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.09824	452700	3641700	440.51	440.51		0 15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.09752	453600	3642200	443.07	443.07		0 16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.09326	453700	3642000	443.5	443.5		0 17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.0846	452679.24	3641720.18	440.45	440.45		0 14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.77077	452700	3641700	440.51	440.51		0 18012916	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.75403	452700	3641700	440.51	440.51		0 15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.7492	453600	3642200	443.07	443.07		0 16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.71555	453700	3642000	443.5	443.5		0 17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.64313	452679.24	3641720.18	440.45	440.45		0 14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00745	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00663	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00643	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.0063	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00624	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.00683	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.0061	453600	3641900	443.08	443.08		0 1 YEARS	MET	4	4	16990

AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.00596	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.0059	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.00578	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00727	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00647	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.0063	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00621	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00611	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.0566	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.05052	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.04936	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.04889	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.04788	453600	3641900	443.08	443.08	0 1 YEARS	MET	4	4	16990

SRP Coolidge Load Analysis Results (8-10-21)

Load Level	Average	Group	Rank	Conc
100%	1-HR	GE_100	1ST	0.2664
75%	1-HR	GE_75	1ST	0.2476
50%	1-HR	GE_50	1ST	0.2209
Startup	1-HR	GE_SU	1ST	**1.8305**
100%	3-HR	GE_100	1ST	0.1519
75%	3-HR	GE_75	1ST	0.1423
50%	3-HR	GE_50	1ST	0.1306
Startup	3-HR	GE_SU	1ST	**1.0818**
100%	8-HR	GE_100	1ST	0.1022
75%	8-HR	GE_75	1ST	0.0989
50%	8-HR	GE_50	1ST	0.0930
Startup	8-HR	GE_SU	1ST	**0.7708**
100%	24-HR	GE_100	1ST	0.0415
75%	24-HR	GE_75	1ST	0.0407
50%	24-HR	GE_50	1ST	0.0385
Startup	24-HR	GE_SU	1ST	**0.3192**
100%	Annual	GE_100	1ST	0.0075
75%	Annual	GE_75	1ST	0.0073
50%	Annual	GE_50	1ST	0.0068
Startup	Annual	GE_SU	1ST	**0.0566**

The Start up/Shut down condition was determined to cause the worst-case impacts for each turbine type.

SRP Coolidge Significant Impact Analysis Results (8-11-21)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Coolidge SIL_2014_CO.SUM	CO	1-HR	ALL	1ST	116.09323	438472.54	3646871.38	566.28	688.35	0	14120518	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	115.95658	466364.13	3636189.44	579.47	784.3	0	17061323	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	115.33147	438672.54	3647971.38	574.36	688.35	0	18022106	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_CO.SUM	CO	1-HR	ALL	1ST	115.0185	438472.54	3646871.38	566.28	688.35	0	15110804	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	108.88881	438172.54	3650071.38	570.56	836.73	0	16012201	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	45.79764	452600	3641700	440.36	440.36	0	18012916	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_CO.SUM	CO	8-HR	ALL	1ST	45.31919	452654.27	3641720.46	440.4	440.4	0	15030616	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	43.85941	453600	3642000	443.26	443.26	0	17042516	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	43.50053	453600	3642200	443.07	443.07	0	16042516	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_CO.SUM	CO	8-HR	ALL	1ST	38.25696	452604.33	3641721	440.35	440.35	0	14051416	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_NO2.SUM	NO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	71.26288	438672.54	3647971.38	574.36	688.35	0	5 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_NOX.SUM	NO2	ANNUAL	ALL	1ST	2.25251	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_NOX.SUM	NO2	ANNUAL	ALL	1ST	2.02127	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_NOX.SUM	NO2	ANNUAL	ALL	1ST	1.96894	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_NOX.SUM	NO2	ANNUAL	ALL	1ST	1.95513	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_NOX.SUM	NO2	ANNUAL	ALL	1ST	1.92618	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_PM10.SUM	PM10	24-HR	ALL	1ST	5.6199	453600	3641900	443.08	443.08	0	18071924	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2017_PM10.SUM	PM10	24-HR	ALL	1ST	5.18403	453600	3642000	443.26	443.26	0	17042524	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2016_PM10.SUM	PM10	24-HR	ALL	1ST	4.99847	453600	3642200	443.07	443.07	0	16042524	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2015_PM10.SUM	PM10	24-HR	ALL	1ST	4.84005	453600	3641900	443.08	443.08	0	15070224	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014_PM10.SUM	PM10	24-HR	ALL	1ST	4.78997	452629.3	3641720.73	440.37	440.37	0	14051424	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2017_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.99454	453600	3641900	443.08	443.08	0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2016_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.8918	453600	3641900	443.08	443.08	0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.87315	453600	3641900	443.08	443.08	0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2018_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.87299	453600	3641900	443.08	443.08	0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2015_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.8554	453600	3641900	443.08	443.08	0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_PM25.SUM	PM25	1ST-HIGHEST 24-HR	ALL	1ST	4.36657	453700	3641900	443.46	443.46	0	5 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_PM25.SUM	PM25	ANNUAL	ALL	1ST	0.84563	453600	3641900	443.08	443.08	0	5 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_SO2.SUM	SO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	2.39942	438672.54	3647971.38	574.36	688.35	0	5 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_SOX.SUM	SO2	24-HR	ALL	1ST	0.44227	453600	3641900	443.08	443.08	0	18071924	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_SOX.SUM	SO2	24-HR	ALL	1ST	0.4054	453600	3642000	443.26	443.26	0	17042524	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_SOX.SUM	SO2	24-HR	ALL	1ST	0.39802	453600	3642200	443.07	443.07	0	16042524	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_SOX.SUM	SO2	24-HR	ALL	1ST	0.38111	453600	3641800	443.07	443.07	0	15062624	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_SOX.SUM	SO2	24-HR	ALL	1ST	0.37303	452629.3	3641720.73	440.37	440.37	0	14051424	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_SOX.SUM	SO2	3-HR	ALL	1ST	1.48812	438272.54	3649671.38	566.65	836.73	0	16012203	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_SOX.SUM	SO2	3-HR	ALL	1ST	1.42927	438572.54	3647271.38	560.49	688.35	0	15112624	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_SOX.SUM	SO2	3-HR	ALL	1ST	1.38924	438172.54	3649571.38	565.77	836.73	0	14103024	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_SOX.SUM	SO2	3-HR	ALL	1ST	1.31764	453700	3641800	443.46	443.46	0	18072612	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_SOX.SUM	SO2	3-HR	ALL	1ST	1.23016	452629.3	3641720.73	440.37	440.37	0	17121012	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.07584	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06806	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06629	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06583	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06485	453600	3641900	443.08	443.08	0	1 YEARS	MET	16	1	16990

SRP Coolidge Significant Impact Analysis Results (8-11-21)

Pollutant	Average	Source Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL	Distance to Significance (km)
NO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	71.26	7.5	950%	25
NO2	ANNUAL	ALL	1ST	2.25	1.0	225%	1.4
CO	1-HR	ALL	1ST	116.09	2000	6%	NA
CO	8-HR	ALL	1ST	45.80	500	9%	NA
PM25	1ST-HIGHEST 24-HR	ALL	1ST	4.37	1.2	364%	21.1
PM25	ANNUAL	ALL	1ST	0.85	0.2	423%	15.9
PM10	24-HR	ALL	1ST	5.62	5.0	112%	0.79
PM10	ANNUAL	ALL	1ST	0.99	1.0	99%	NA
SO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	2.40	7.8	31%	NA
SO2	3-HR	ALL	1ST	1.49	25	6%	NA
SO2	24-HR	ALL	1ST	0.44	5.0	9%	NA
SO2	ANNUAL	ALL	1ST	0.08	1.0	8%	NA

ARM2 with minimum and maximum ambient ratios of 0.5 and 0.9, respectively for NOx to NO2 conversion.

The PM2.5 modeled concentration includes a secondary contribution (see attached MERPs calculation).

The area is non-attainment for PM10. However, PM10 was modeled and compared to the SILS and NAAQS.

Modeled emissions and stack parameters for existing units are from the 2008 Coolidge application. Emission rates reflect worst case startup/shut down rates.

SRP Coolidge NAAQS Analysis Results (8-11-21)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Coolidge NAAQS_2014-2018_NO2.SUM	NO2	8TH-HIGHEST MAX DAILY 1-HR	ALL	1ST	103.59537	438672.54	3647971.38	574.36	688.35		0 5 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_NO2.SUM	NO2	8TH-HIGHEST MAX DAILY 1-HR	SRP	1ST	103.59223	438672.54	3647971.38	574.36	688.35		0 5 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_NO2.SUM	NO2	8TH-HIGHEST MAX DAILY 1-HR	STING	1ST	11.30507	452200	3642700	439.19	439.19		0 5 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2017_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.69701	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2016_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.34896	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.19732	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2015_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.13801	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2018_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.07895	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2017_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.69138	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2016_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.34238	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.19185	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2015_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.13245	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2018_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.07358	453600	3642000	443.26	443.26		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2018_NOX.SUM	NO2	ANNUAL	STING	1ST	1.27025	452200	3642700	439.19	439.19		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2017_NOX.SUM	NO2	ANNUAL	STING	1ST	1.25215	452200	3642700	439.19	439.19		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014_NOX.SUM	NO2	ANNUAL	STING	1ST	1.19651	452200	3642700	439.19	439.19		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2016_NOX.SUM	NO2	ANNUAL	STING	1ST	1.15419	452200	3642700	439.19	439.19		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2015_NOX.SUM	NO2	ANNUAL	STING	1ST	1.134	452200	3642700	439.19	439.19		0 1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	24-HR	ALL	6TH	41.05397	452200	3642700	439.19	439.19		0 15111324	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	24-HR	SRP	6TH	4.90295	453700	3641900	443.46	443.46		0 17070324	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	24-HR	STING	6TH	40.97719	452200	3642700	439.19	439.19		0 15110724	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	ANNUAL	ALL	1ST	13.39957	452200	3642700	439.19	439.19		0 5 YEARS	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	ANNUAL	SRP	1ST	1.12668	453600	3642000	443.26	443.26		0 5 YEARS	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	ANNUAL	STING	1ST	12.88563	452200	3642700	439.19	439.19		0 5 YEARS	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	8TH-HIGHEST 24-HR	ALL	1ST	3.6882	453700	3641900	443.46	443.46		0 5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	8TH-HIGHEST 24-HR	SRP	1ST	3.68026	453700	3641900	443.46	443.46		0 5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	8TH-HIGHEST 24-HR	STING	1ST	3.12347	452200	3642700	439.19	439.19		0 5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	ANNUAL	ALL	1ST	1.77668	452200	3642700	439.19	439.19		0 5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	ANNUAL	SRP	1ST	1.12668	453600	3642000	443.26	443.26		0 5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	ANNUAL	STING	1ST	1.28856	452200	3642700	439.19	439.19		0 5 YEARS	MET	71	3	16990

SRP Coolidge NAAQS Analysis Results (8-11-21)

Pollutant	Average	Source Group	Rank	Model Conc. (ug/m3)	Background (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	%Standard	Comment
NO2	8TH-HIGHEST MAX DAILY 1-HR	ALL	1ST	103.60	20.00	123.60	188	66%	
NO2	ANNUAL	ALL	1ST	3.70	15.69	19.38	100	19%	
PM25	8TH-HIGHEST 24-HR	ALL	1ST	3.69	21.00	24.69	35	71%	24-hr secondary PM2.5 contribution < 0.01 ug/m3
PM25	8TH-HIGHEST 24-HR	SRP	1ST	3.68	21.00	24.68	35	71%	
PM25	8TH-HIGHEST 24-HR	STING	1ST	3.12	21.00	24.13	35	69%	
PM25	ANNUAL	ALL	1ST	1.78	8.10	9.88	12	82%	Annual secondary PM2.5 contribution < 0.01 ug/m3
PM25	ANNUAL	SRP	1ST	1.13	8.10	9.23	12	77%	
PM25	ANNUAL	STING	1ST	1.29	8.10	9.39	12	78%	
PM10	24-HR	ALL	6TH	41.05	96.00	137.05	150	91%	Max impact occurs inside Stinger Welding fence.
PM10	24-HR	STING	6TH	40.98	96.00	136.98	150	91%	

ARM2 with minimum and maximum ambient ratios of 0.5 and 0.9, respectively for NOx to NO2 conversion.
The PM2.5 modeled concentration includes a secondary contribution (see attached MERPs calculation).
The area is non-attainment for PM10. However, PM10 was modeled and compared to the SILS and NAAQS.
Modeled emission are from the 2008 Coolidge application and represent startup/shut down rates. Stack parameters were also obtained from the 2008 application.
NO2 background values are the 2018-19 design values from Tucson (AQS No. 4-19-1028).
PM10 bacground values were calculated from the 2017-19 monitor in Coolidge (AQS No. 4-21-3004) which demonstates attainment.
PM2.5 background values are the 2018-19 design values from Orange Grove (AQS No. 4-19-0011).
"ALL" source group represents all 28 turbines at Coolidge and nearby Stinger Welding.

MERPS Calculation

Secondary PM2.5 Calculation (Use Source 4007, Gila Co, AZ - 500 TPY, 10m Release)

Precursor	Modeled Emissions of Hypothetical Source (MER) (TPY)	Release Height of Hypothetical Source (m)	Project Emissions (TPY)	Max 24-hr Impact of Hypothetical Source (MIHS) (ug/m3)	Max Annual Impact of Hypothetical Source (MIHS) (ug/m3)	24-hr Project Impact (ug/m3)	Annual Project Impact (ug/m3)
NOx	500	10	141.50	0.011	0.001	0.003	0.0003
SO2	500	10	4.70	0.035	0.002	0.000	0.0000
					Total	**0.003**	**0.0003**

Project Impact = max impact hypothetical source divided by emissions of hypo source multiplied by the project emissions

Example 24hr NOx:

0.011 ug/m3 divided by 500 TPY times 141.5 TPY = 0.003 ug/m3

Ozone Impact Calculation (Use Source 4007, Gila Co, AZ - 500 TPY, 10m Release)

Precursor	Modeled Emissions of Hypothetical Source (MER) (TPY)	Release Height of Hypothetical Source (m)	Project Emissions (TPY)	Max 8-hr Impact of Hypothetical Source (MIHS) (ppb)	Calculated 8-hr Project Impact (ppb)	
NOx	500	10	141.5	1.226	0.35	
VOC	500	10	50.2	0.025	0.003	
				Total	**0.35**	Ozone SIL = 1.0 ppb

Project Impact = max impact hypothetical source divided by emissions of hypo source multiplied by the project emissions

Example 8hr NOx:

1.226 ppb divided by 500 TPY times 141.5 TPY = 0.35 ppb

REFERENCES

1. Guideline on Air Quality Models, Appendix W of 40 CFR Part 51, U.S. Environmental Protection Agency, 2017).

2 . Air Dispersion Modeling Guidelines for Arizona Air Quality Permits, Air Quality Permit Section, Arizona Department of Environmental Quality, November 1, 2019.

3. Auer, Jr., A.H. "Correlation of Land Use and Cover with Meteorological Anomalies." Journal of Applied Meteorology, 17:636-643, 1978.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, EPA, May 1987.

6. Monitoring Guidelines at p. 9.

7. United States Census Bureau, population in 2019 was 462,789.
https://www.census.gov/quickfacts/fact/table/pinalcountyarizona/PST045219.

Pinal County, population in 2020 was 425,264.
https://www.pinalcountyaz.gov/News/Pages/Article.aspx?myID=1632
.

8. U.S. EPA, DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling, February 10, 2020.

APPENDIX C

Construction Phase Emissions Calculations

Emission Summary

Source	Emissions (tons/yr)					
	VOC	CO	NO_X	$PM/PM_{10}/PM_{2.5}$	SO_2	CO_2
Construction Vehicles and Equipment	5.69	39.67	100.40	3.22	3.66	2876.61
Light Duty Construction Vehicle Tailpipe Emissions	0.19	2.74	0.19	0.02	0.02	103.77
Wind Erosion - Storage Piles	-	-	-	0.01	-	-
Haul Roads Vehicle Traffic	-	-	-	0.02		-
Total	5.88	42.41	100.59	3.27	3.68	2980.38

Annual Emissions (Max Emitting Year)

Equipment Type	HP	VMT	Load Factor	Annual Hours of Use [1]	Emission Factors [2,3]						Max Annual Emissions (tpy)					
					HC	CO	NO_x	$PM/PM_{10}/PM_{2.5}$	SO_2	CO_2	VOC [4]	CO	NO_x	$PM/PM_{10}/PM_{2.5}$	SO_2	CO_2
Construction Vehicles and Equipment																
Mowers	25	NA	0.590	0.000	0.446	2.270	4.493	0.234	0.16	13.2	0.000	0.000	0.000	0.000	0.000	0.000
Bulldozers	130	NA	0.590	0.000	0.362	1.393	3.942	0.188	0.16	106	0.000	0.000	0.000	0.000	0.000	0.000
Dump Trucks	500	NA	0.800	2523.429	0.178	1.354	4.168	0.114	0.16	7.6	0.248	1.883	5.797	0.159	0.223	9.589
Portable Generators	100	NA	0.430	0.000	0.374	2.485	4.756	0.201	0.16	75	0.000	0.000	0.000	0.000	0.000	0.000
Jackhammers	25	NA	0.430	0.000	0.856	6.386	5.232	0.489	0.16	13.2	0.000	0.000	0.000	0.000	0.000	0.000
Delivery Trucks	500	NA	0.800	7508.571	0.178	1.354	4.168	0.114	0.16	7.6	0.738	5.604	17.248	0.472	0.662	28.533
Fork Lifts	100	NA	0.430	8071.714	0.393	3.802	4.519	0.269	0.16	31.2	0.349	3.383	4.020	0.240	0.142	125.919
75-ton Crane	420	NA	0.430	8735.143	0.170	0.885	4.387	0.077	0.16	129	0.687	3.579	17.742	0.310	0.647	563.417
250-ton Crane	420	NA	0.430	8071.714	0.170	0.885	4.387	0.077	0.16	129	0.635	3.307	16.395	0.287	0.598	520.626
Excavators	250	NA	0.590	0.000	0.330	1.201	3.846	0.169	0.16	245	0.000	0.000	0.000	0.000	0.000	0.000
Air Compressors	25	NA	0.430	27477.000	0.856	6.386	5.232	0.489	0.16	14.4	0.648	4.836	3.962	0.370	0.121	197.834
Air Tools	25	NA	0.430	6726.429	0.856	6.386	5.232	0.489	0.16	13.2	0.159	1.184	0.970	0.091	0.030	44.394
Tuggers	500	NA	0.800	5005.714	0.178	1.354	4.168	0.114	0.16	7.6	0.492	3.736	11.499	0.315	0.441	19.022
Concrete Pumps	100	NA	0.430	331.714	0.374	2.485	4.756	0.201	0.16	77.9	0.014	0.091	0.174	0.007	0.006	12.920
Welders	25	NA	0.430	16770.000	0.856	6.386	5.232	0.489	0.16	11.3	0.396	2.951	2.418	0.226	0.074	94.751
Pumps	100	NA	0.430	24731.143	0.374	2.485	4.756	0.201	0.16	77.9	1.019	6.774	12.967	0.548	0.436	963.278
Road Pavers	500	NA	0.800	2523.429	0.178	1.354	4.168	0.114	0.16	233	0.248	1.883	5.797	0.159	0.223	293.979
Cement Trucks	500	NA	0.800	617.143	0.178	1.354	4.168	0.114	0.16	7.6	0.061	0.461	1.418	0.039	0.054	2.345
Light Duty Construction Vehicle Tailpipe Emissions																
LDGV	NA	187714.286	NA		0.903	13.222	0.903	0.093	0.113	501.504	0.187	2.736	0.187	0.019	0.023	103.771
Total											**5.881**	**42.409**	**100.591**	**3.242**	**3.681**	**2980.377**

[1] Equipment that have zero hours of annual use are used in phases that do not overlap with the phase in which the worst-case annual emissions will occur. Hours of use are scaled by the load factor that represents how long a piece of equipment typically operates during a workday

[2] Emission factors for construction vehicles and equipment were obtained from Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling Compression-Ignition are in units of g/hp-hr. Emission factors for light duty construction vehicle tailpipe emissions were obtained from Chapter 5 of the 2002 Periodic Ozone Emission Inventory by the Maricopa Association of Governments and are in units of g/mi.

[3] CO2 Emission factor for LDGV obtained from the Updated Emission Factors of Air Pollutants from Vehicle Operations in GREETTM Using MOVES. And U.S. EPA. Greenhouse Gas and Energy Consumption Rates for On-Road Vehicles: Updates for MOVES 2014. Available Online at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNUQ.pdf

[4] VOC is conservatively approximated as being equal to HC.

Storage Piles

Source	Pollutants	Number of Piles	Hours Stored per Year (hrs/yr)	Emission Factor (lbs/hr/pile)	Emissions (tons/yr)
Wind Erosion - Aggregate Pile	PM_{10}	5	1800	0.00005	0.000225
	PM			0.0001	0.00045
Wind Erosion - Dirt/Sand Pile	PM_{10}	10	1800	0.0006	0.0054
	PM			0.0012	0.0108
			Totals	**PM_{10}**	**0.005625**
				PM	**0.01125**

Haul Roads - Vehicle Traffic

Source	Pollutants	Vehicle Miles Travelled per Year	Emission Factor (lbs/VMT)	Emissions (tons/yr)
Skidsteer and Wheeled Loaders	PM_{10}	100	0.19	0.010
	PM		0.73	0.037
Ready Mix Trucks	PM_{10}	100	0.17	0.009
	PM		0.66	0.033
		Totals	**PM_{10}**	**0.018**
			PM	**0.070**

Note: Storage pile and haul road emission factors were obtained from the ADEQ General Permit Application for Concrete Batch Plants. No Concrete Batch Plant will be associated with this project.

EXHIBIT B-2 – GROUNDWATER AVAILABILITY ASSESSMENT

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2/36

TECHNICAL MEMORANDUM

To: William McClellan, Spence Wilhelm, and Joseph Gardner, Salt River Project

From: Chris Garrett, Hydrologist

Date: November 24, 2021

Re: **Coolidge Expansion Groundwater Availability Assessment / SWCA Project No. 00065028-000-PHX**

PURPOSE OF MEMO

The purpose of this technical memorandum is to assess the physical and regulatory availability of the proposed water supply for the Coolidge Expansion project, in order to demonstrate that the proposed water supply would be sufficient for the project and use of that water supply would be consistent with both regulation and groundwater management direction in the region.

HYDROLOGIC SETTING

General Hydrologic Framework

The Coolidge Expansion project is located on 100 acres in Pinal County (Township 6 South Range 8 East Section 10), in an area designated under Arizona's groundwater regulatory framework as the Eloy subbasin of the Pinal Active Management Area (AMA). Physically, the Eloy groundwater subbasin is part of the basin-and-range physiographic province of Central Arizona, which is characterized by deep alluvial basins separated by mountain ranges generally trending northwest to southeast. Extensive, deep, and productive aquifers are associated with the alluvial basins. For the purposes of groundwater supply, the consolidated rock of the bounding mountain ranges is considered to be an impervious boundary to the alluvial basin aquifers.

The Eloy subbasin is located in the eastern part of the Pinal AMA and is bounded by the Sacaton and San Tan Mountains to the north, by the Tortilla Mountains and Picacho Mountains to the east (Figure 1). To the west, the Eloy subbasin is separated from the Maricopa-Stanfield subbasin by a subsurface ridge of shallow, buried bedrock referred to generally as Casa Grande Ridge. This ridge trends in a north-south direction from the Sacaton Mountains to the Silver Reef Mountains and lies about 150 feet below the land surface (Liu et al. 2014).

ADWR generally divides the alluvial aquifers in the Pinal AMA into four major hydrogeologic units (Liu et al 2014). From top to bottom these are:

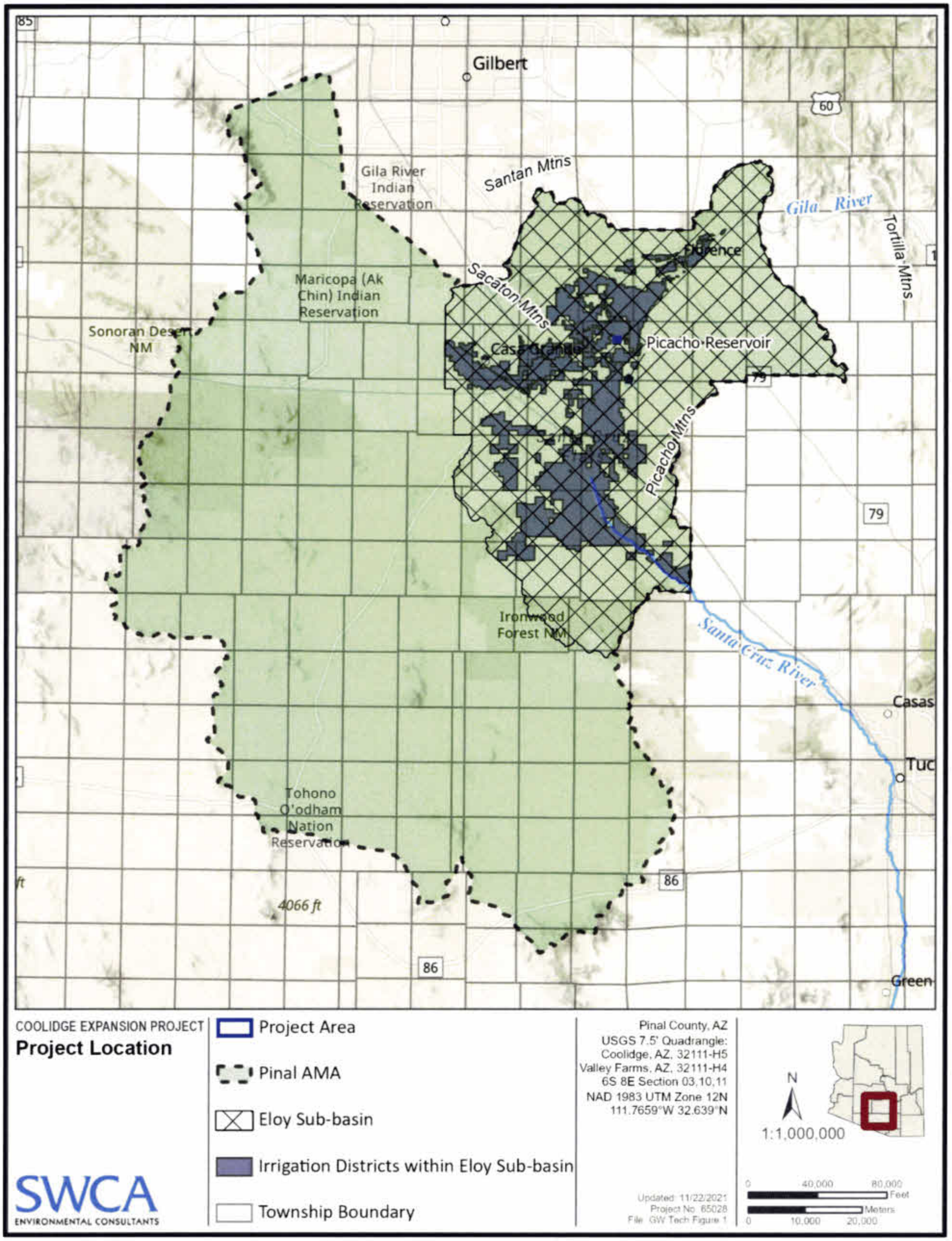
- Upper Alluvial Unit (UAU). The UAU consists of largely unconsolidated interbedded sand and gravel, with some finer-grained materials present as discrete lenses. In the vicinity of the project, the UAU is estimated to be about 350 feet thick.

- Middle Silt and Clay Unit (MSCU). The MSCU is a fine-grained unit that consists primarily of silt, clay, and sand. In the vicinity of the project, the MSCU is estimated to be from 1,250 to 1,600 feet thick.
- Lower Conglomerate Unit (LCU). The LCU is the deepest water-bearing unit and consists of semi- to fully-consolidated coarse sediments, such as granite fragments, cobbles, boulders, sands, and gravels. In the vicinity of the project, the LCU is estimated to be from 1,500 to 2,000 feet thick.
- Hydrogeologic Bedrock Unit (HBU). Hydrologically, the underlying bedrock unit is considered to be impermeable and not part of the productive aquifer.

The thickness of alluvial aquifer materials in the subbasin ranges from several hundred feet along the margins of the basin, to almost 10,000 feet in the center of the basin. Taken together, the productive aquifer (UAU, MSCU, LAU) in the vicinity of the project site is estimated to be roughly 3,000 to 4,000 feet thick (Liu et al 2014; Richard et al. 2007). The on-site wells are completed in the UAU and MSCU.

In the Pinal AMA, recharge to the aquifer occurs both naturally and from anthropogenic activities. Natural recharge includes mountain-front recharge, infiltration from major stream channels (primarily the Gila River and the Santa Cruz River), and groundwater underflow from adjacent basins. Anthropogenic recharge includes agricultural return flow, canal infiltration, recharge from Picacho Reservoir, effluent recharge (Casa Grande Wastewater Treatment Plant), and artificial recharge either directly or through groundwater-savings facilities. The largest source of recharge is agriculture incidental recharge and canal losses, which account for about 80 percent of all inflows.

Discharge of groundwater from the Pinal AMA aquifers largely consists of pumping (over 90 percent of all discharge), relatively small amounts of evapotranspiration along riparian areas where groundwater is relatively shallow, and groundwater discharge to adjacent basins. Groundwater near the project generally flows from the southeast to the northwest, where it generally discharges as underflow into the East Salt River Valley.


Gilbert
60
Gila River Indian Reservation
Santan Mtns
Gila River
Tortilla Mtns
Florence
Sacaton Mtns
Maricopa (Ak Chin) Indian Reservation
Sonoran Desert NM
Casa Grande
Picacho Reservoir
79
Picacho Mtns
Ironwood Forest NM
Santa Cruz River
Casas
Tuc
Tohono O'odham Nation Reservation
86
4066 ft
Green
COOLIDGE EXPANSION PROJECT
Project Location
Project Area
Pinal AMA
Eloy Sub-basin
Irrigation Districts within Eloy Sub-basin
Township Boundary
Pinal County, AZ
USGS 7.5' Quadrangle:
Coolidge, AZ, 32111-H5
Valley Farms, AZ, 32111-H4
6S 8E Section 03,10,11
NAD 1983 UTM Zone 12N
111.7659°W 32.639°N
N
1:1,000,000
Updated: 11/22/2021
Project No. 65028
File: GW Tech Figure 1
0 40,000 80,000 Feet
0 10,000 20,000 Meters
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Approximately 150 registered wells are located within 1 mile of the proposed project area,[1] as shown in Appendix A (Arizona Department of Water Resources [ADWR] 2021a, 2021b) (Figure 2). The ADWR well registry files (also known as the 55-files) generally have information provided to ADWR at the time the well is drilled, which may or may not reflect current conditions. However, about half of these wells are also found in the ADWR Groundwater Site Inventory (GWSI). Unlike the well registry files, the ADWR GWSI contains verified field measurements over time, including water levels, pumping rates, and water quality.

The well records confirm that the alluvial sediments near the project site are both deep and highly productive. The vast majority of wells are drilled less than 1,000 feet deep, with several exceptions including one well drilled to a depth of 2,500 feet. Reported pumping capacities are as high as 1,950 gallons per minute (gpm).

Site-specific drilling, well construction, and water quality monitoring have also been conducted for the existing Coolidge Generating Station (AMEC 2009; Schlumberger 2011). These studies estimated that on-site wells could produce from 1,000 to 1,800 gpm, but recommended drawing water from a depth above 400 feet, due to elevated concentrations of total dissolved solids at depth (discussed further below).

Groundwater Levels and Trends

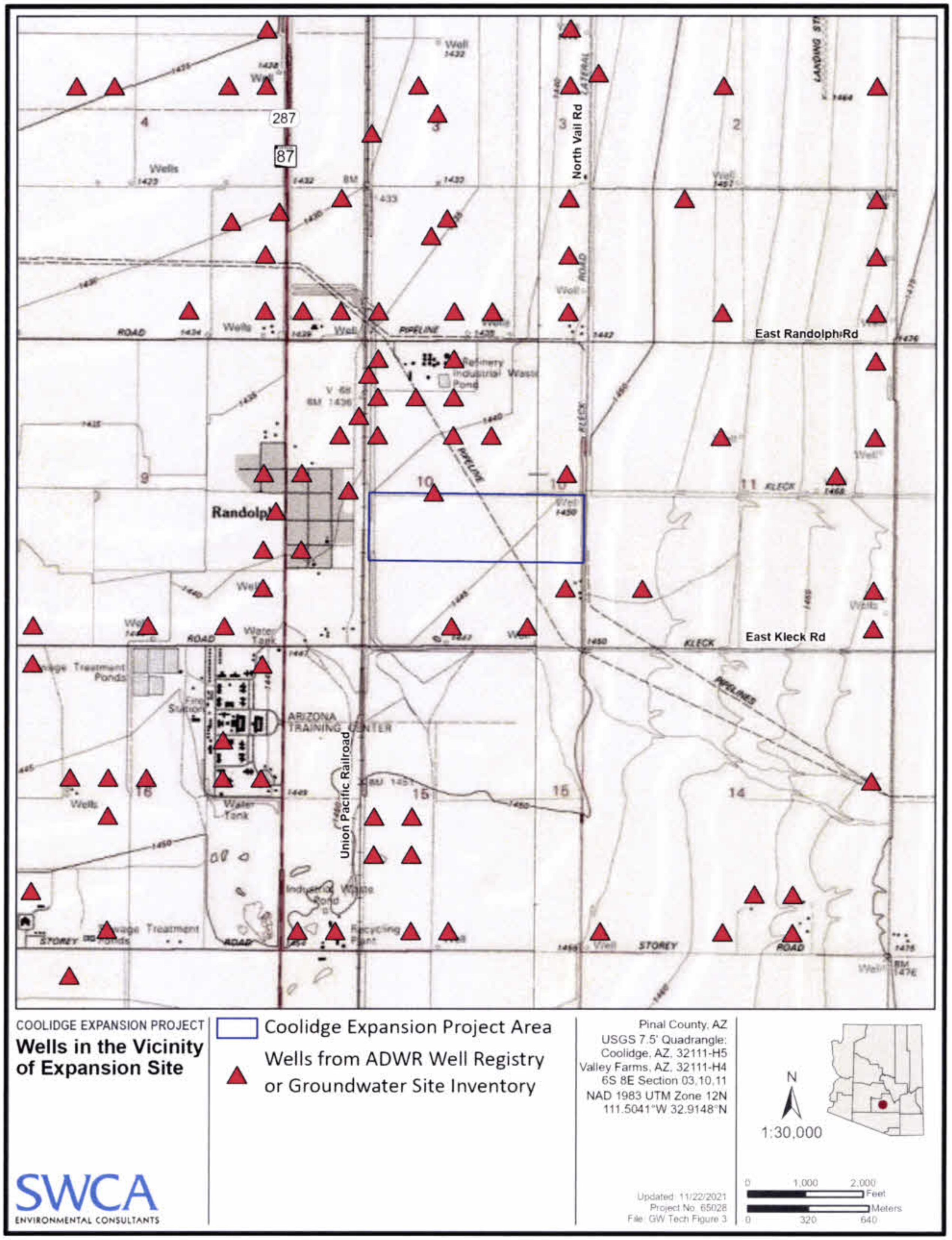
Several wells in the near vicinity of the project are index wells, which means that ADWR monitors their water levels on a regular basis. These wells represent the best source for understanding long-term water level trends in the vicinity of the project. Hydrographs for two of these wells are shown Appendix B, and well locations are shown in Figure 3.

The groundwater levels shown in Appendix B follow a typical trend in the Pinal AMA. The post-war boom in agriculture in Pinal County was supplied almost entirely by groundwater, and as a result groundwater levels in the basin declined steeply until the 1970s. Near the Coolidge Expansion project, the decline in groundwater levels reached well over 100 feet, as shown in Figure B-1 in Appendix B. However, a number of statewide trends that started in the 1970s resulted in a halt and then a reversal of groundwater level declines in the basin. These include reduced groundwater pumping, increased use of Central Arizona Project (CAP) water, and flood recharge from large flood events along the Gila and Santa Cruz Rivers. As a result, by the turn of the century groundwater levels in the vicinity of the project had largely recovered to 1940s levels. In the last two decades groundwater levels have held relatively steady, though in recent years they appear to have started to decline again.

The estimated depth to water at the project site could range from about 70 feet, based on nearby index wells (hydrographs shown in Appendix B), to around 100 feet, based on the site-specific well sampling (note that this sampling occurred roughly a decade ago). The most recent groundwater levels available from the ADWR GWSI indicate that depth to water ranges from 63 to 103 feet below ground surface[2].

[1] Records were obtained from the ADWR GWSI and Well Registry for Sections 2, 3, 4, 9, 10, 11, 14, 15, and 16 of Township 6 South, Range 8 East.

[2] An additional 11 recent water level measurements were obtained from the same sections listed in the previous footnote. All water levels were measured in either 2019 or 2020, and ranged from 63 to 103 feet with an average of 85 feet.


287
87
North Vail Rd
East Randolph Rd
East Kleck Rd
Randolph
Union Pacific Railroad
ARIZONA TRAINING CENTER
PIPELINE
PIPELINES
KLECK
STOREY
ROAD
Refinery Industrial Waste Pond
Sewage Treatment Ponds
Water Tank
Fire Station
Industrial Waste Pond
Recycling Plant
Wells
Well
COOLIDGE EXPANSION PROJECT
Wells in the Vicinity of Expansion Site
Coolidge Expansion Project Area
Wells from ADWR Well Registry or Groundwater Site Inventory
Pinal County, AZ
USGS 7.5' Quadrangle:
Coolidge, AZ, 32111-H5
Valley Farms, AZ, 32111-H4
6S 8E Section 03,10,11
NAD 1983 UTM Zone 12N
111.5041°W 32.9148°N
N
1:30,000
0 1,000 2,000 Feet
0 320 640 Meters
Updated: 11/22/2021
Project No. 65028
File: GW Tech Figure 3
SWCA
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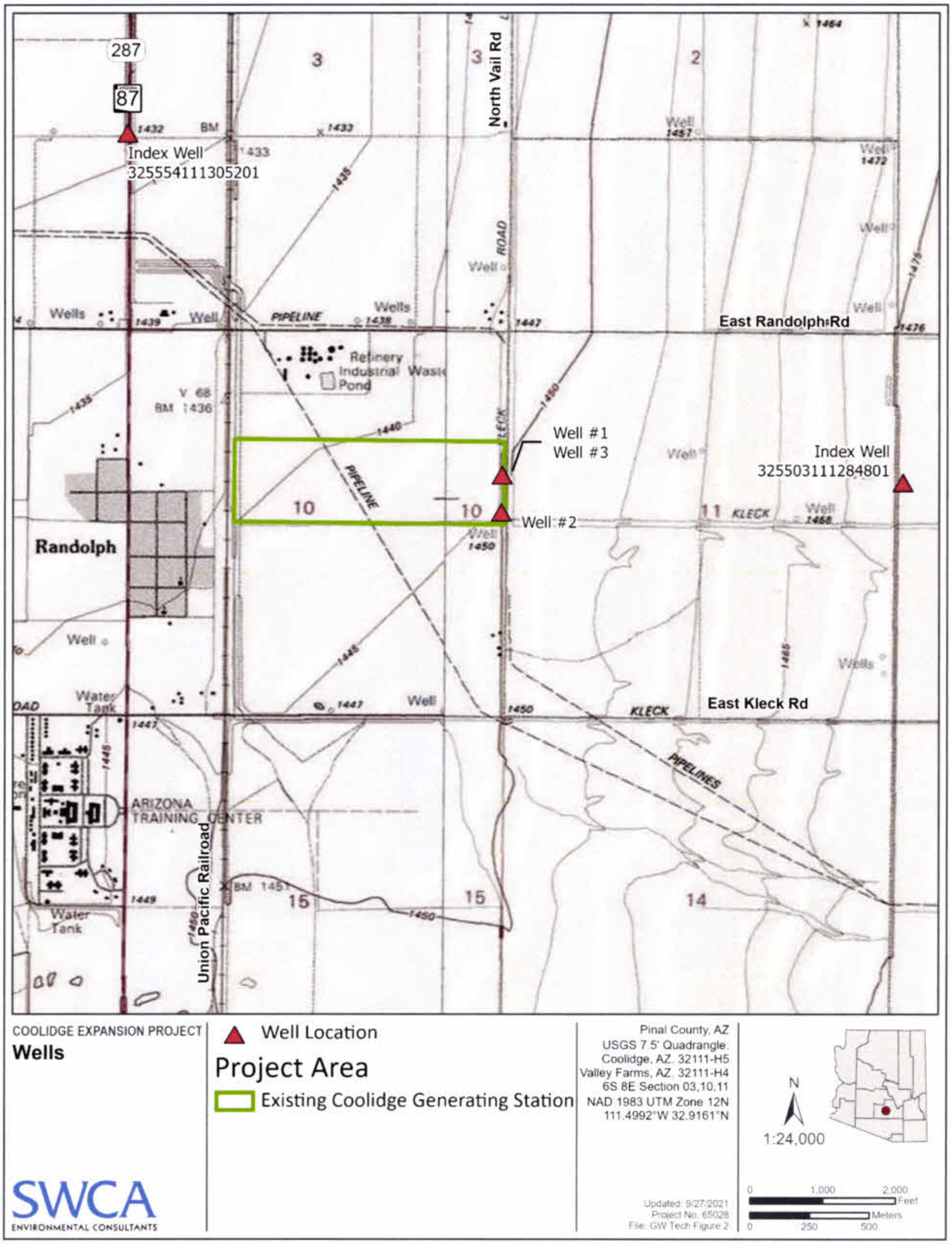
287
87
North Vail Rd
Index Well
325554111305201
Well #1
Well #3
Index Well
325503111284801
Well #2
East Randolph Rd
East Kleck Rd
Refinery
Industrial Waste
Pond
Randolph
ARIZONA
TRAINING CENTER
Union Pacific Railroad
PIPELINE
PIPELINES
KLECK
Water Tank
3
2
10
11
15
14
COOLIDGE EXPANSION PROJECT
Wells
Well Location
Project Area
Existing Coolidge Generating Station
Pinal County, AZ
USGS 7.5' Quadrangle:
Coolidge, AZ, 32111-H5
Valley Farms, AZ, 32111-H4
6S 8E Section 03,10,11
NAD 1983 UTM Zone 12N
111.4992°W 32.9161°N
N
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0 1,000 2,000 Feet
0 250 500 Meters
Updated: 9/27/2021
Project No. 65028
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Groundwater Quality

The Pinal AMA generally has groundwater quality that is acceptable for most uses. However, there are known water quality concerns in the basin including areas of high dissolved solids, nitrates, and fluoride. The most pertinent and detailed source for assessing groundwater quality available near the site is from the site-specific water quality obtained from exploratory drilling conducted for the Coolidge Generating Station (AMEC 2009) and water quality collected after drilling three production wells (Schlumberger 2011). Water quality results are shown in Tables 1 and 2.

Prior to drilling wells for the Coolidge Generating Station, water samples from exploratory boring were collected at specific depths in the aquifer and analyzed for water quality. The depth-specific results are shown in Table 1 for common inorganic analytes. The drilling found that overall water quality deteriorated at depth with high levels of dissolved solids, sulfate, and fluoride. As a result, recommendations from the investigation included focusing water production to depths of less than 400 feet.

Table 1. Depth-Specific Water Quality Samples Collected Near the Project Site (June 2008)

Analyte	Units	Depth of 1,804 feet	Depth of 850 feet	Depth of 700 feet	Depth of 520 feet	Depth of 335 feet	Depth of 295 feet	Depth of 240 feet	Notes
Total dissolved solids	mg/L	16,000	5,700	7,700	8,500	1,200	1,300	720	Secondary non-enforceable standard of 500 mg/L for drinking water; water generally less than 1,000 mg/L is considered fair (World Health Organization 2017)
Nitrate	mg/L	NT	NT	0.94	<0.50	7.4	5.5	3.1	Arizona aquifer water quality standard of 10 mg/L
Sulfate	mg/L	NT	2,500	1,300	1,200	250	300	140	Secondary non-enforceable standard of 250 mg/L for drinking water
Arsenic	mg/L	NT	NT	0.0086	0.0093	0.003	<0.003	0.0037	Arizona aquifer water quality standard of 0.050 mg/L
Fluoride	mg/L	NT	1.7	2.8	3.1	0.61	0.77	0.98	Arizona aquifer water quality standard of 4.0 mg/L

Source: AMEC (2009)
NT – Not tested due to limited sample volume
Mg/L – milligrams per liter

Following the exploratory water sampling, three production wells were drilled for the Coolidge Generating Station (Wells #1, #2, and #3 on Figure 3), and water quality samples were collected from two of these wells (Schlumberger 2011). Guided in part by the findings, the screened intervals of these production wells were limited to less than 600 feet. Water quality results for Wells #1 and #2 are shown in Table 2. Relatively high concentrations of total dissolved solids, nitrate, and sulfate were observed, consistent with the depth-specific sampling.

Table 2. Water Quality Samples Collected from Coolidge Generating Station Production Wells

Analyte	Units	Well #1 Well Reg. 55-218256 Screened from 260–580 feet (August 2009)	Well #2 Well Reg. 55-218257 Screened from 220–580 feet (July 2009)	Notes
Total dissolved solids	mg/L	650	2,600	Secondary non-enforceable standard of 500 mg/L for drinking water; water generally less than 1,000 mg/L is considered fair (World Health Organization 2017)
Nitrate	mg/L	3.2	10	Arizona aquifer water quality standard of 10 mg/L
Sulfate	mg/L	120	760	Secondary non-enforceable standard of 250 mg/L for drinking water
Arsenic (dissolved)	mg/L	0.0092	<0.0050	Arizona aquifer water quality standard of 0.050 mg/L
Fluoride	mg/L	1.3	1.1	Arizona aquifer water quality standard of 4.0 mg/L

Source: Schlumberger (2011)
Mg/L – milligrams per liter

Land Subsidence

An undesirable effect of the pumping of groundwater from alluvial sediments is subsidence, or lowering, of the land surface. Land subsidence has occurred in multiple locations in Arizona since the early 1990s, with some areas estimated to have subsided more than 18 feet since that time.

Land subsidence is caused by the compaction of alluvium once groundwater is removed from the void space between particles. The pores in the alluvium that were held open by water pressure collapse, causing lowering of the land surface over wide areas. In addition, where subsidence occurs over areas of extreme bedrock topography, differential subsidence can occur. This occurs when two parts of the surface are subsiding at different rates, which can cause earth fissures at the surface.

The Eloy sub-basin is a known area of subsidence and is actively monitored by ADWR. Subsidence monitoring using satellite-based Interferometric Synthetic Aperture Radar (InSAR) allows subsidence to be quantified in detail across the entire basin. An example of the subsidence that has occurred in the project area in the 11 years between 2010 and 2021 is shown in Appendix C (ADWR 2021c). Over this time period, from 0 to 10 centimeters of subsidence has occurred in the project area, up to roughly 1 centimeter per year. No earth fissures have been identified in the near vicinity of the Coolidge Expansion project; the nearest earth fissures occur roughly 3 to 4 miles eastward, near the margin of the basin.

REGULATORY FRAMEWORK

Arizona Management of Groundwater Resources

Groundwater overdraft has been recognized as a problem in Arizona since before World War II. In 1980, Arizona passed the Groundwater Management Act (Arizona Revised Statutes [ARS], Title 45, Chapter 2), which established a statewide system of groundwater management, including requiring groundwater rights within areas of critical management known as AMAs.

Groundwater may not be pumped within an AMA without authorization from ADWR. Authorization can take several forms:

- The Groundwater Management Act established a number of Irrigation Grandfathered Rights, based on historic agricultural uses. These rights are for a specific annual volume of groundwater with extraction and use tied to a specific piece of land.
- The Groundwater Management Act also established Type 1 Non-Irrigation Grandfathered Rights, which are associated with retired agricultural land, with the use of the water tied to a specific piece of land.
- Another form of groundwater right established were Type 2 Non-Irrigation Grandfathered Rights, which are for specific uses other than retired agricultural land and can be transferred to new locations.
- There are also a number of withdrawal permits that ADWR can issue for specific uses, including for dewatering, drainage, poor quality water, mineral extraction, and industrial use.
- Later additions to the groundwater management code in 1986 and 1994 included programs to manage the storage of surface water underground in various ways. Storing water underground results in the assignment of "long-term storage credits". These long-term storage credits can be later recovered from groundwater wells that have been permitted to do so.

Management Direction for the Pinal AMA

The 1980 Groundwater Management Act established a management goal for each AMA. Unlike the other major AMAs—Phoenix, Tucson, and Prescott—which have a management goal of safe-yield (in which groundwater use does not exceed natural recharge), the management goal of the Pinal AMA has always been focused on the continued use of groundwater rather than safe-yield:

> The management goal of the Pinal active management area is to allow development of non-irrigation uses as provided in this chapter and to preserve existing agricultural economies in the active management area for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses. (ARS 45-562.B)

In subsequent management plans for the Pinal AMA, ADWR noted that "this goal is unquantified in the Groundwater Code. The law does not specify how much water must be preserved for non-irrigation uses, nor does it list any criteria by which to determine how long agricultural economies should be preserved." (ADWR 1991). Faced with this loose definition, ADWR developed an interpretation of the management goal to be "the preservation of groundwater between 1,000 and 1,200 feet below land surface for future non-irrigation uses" (ADWR 1991). In other words, agricultural demands would be able to use any groundwater above 1,000 feet (pumping from deeper than this was anticipated to be uneconomical for most agricultural users), which would leave accessible groundwater for future residential, commercial, and industrial uses. This goal commonly has been termed "planned depletion" (ADWR 1999).

In the latest management plan (the Fourth Management Plan, currently in effect), ADWR has explicitly moved away from the concept of "planned depletion" and instead determined that "in the [Pinal AMA], groundwater is managed to ensure that all users have a groundwater supply into the future." (ADWR 2020).

While specific goals and interpretations have varied over time, common to all groundwater management in the Pinal AMA since the adoption of the 1980 Groundwater Management Code is the concept that the trend in the Pinal AMA will be the continued use of groundwater, with a long-term transition from agricultural groundwater uses to non-agricultural groundwaters uses, including industrial uses. The regulatory structure in place in the Pinal AMA is designed to ensure this transition is done in a manner that tends to reduce groundwater use overall. Two pertinent examples of this inherent reduction include the following:

- The conversion of Irrigation Grandfathered Rights to Type 1 Non-Irrigation Grandfathered Rights generally involves a reduction in groundwater use. As a specific example, the Coolidge Generating Station previously converted 100 acres of an existing Irrigation Grandfathered Right to a Type 1 Non-Irrigation Right (58-111884.0011). The water duty for the original irrigation right was 4 acre-feet per acre, resulting in a right to pump about 370 acre-feet of groundwater per year. Once converted, however, the Type 1 Non-Irrigation Right was reduced to 279 acre-feet. This is because by law the conversion is capped at a per-acre water duty of 3 acre-feet (ARS 45-469.F). In essence, the conversion of this water right automatically reduced future groundwater use by 25 percent.

- When using long-term storage credits, generally only 95 percent of the stored water is allowed to be recovered (ARS 45-852.01). This provides for an overall improvement in aquifer storage in the long term, while still allowing flexibility for recovering groundwater for use.

Specific Management Direction for Large-Scale Power Plants

ADWR regulates conservation requirements for large-scale power plants, as described in the Fourth Management Plan:

> The objective of the Industrial Conservation Program is to move industrial users within the Pinal AMA (PAMA) to the greatest level of water use efficiency economically attainable given the use of the latest available water conservation technology. The 4MP also provides incentives to encourage industrial users to replace groundwater supplies with renewable supplies. Efficient use of groundwater and the replacement of groundwater sources with renewable supplies contribute to the achievement and maintenance of the PAMA water management goal. (ADWR 2020)

The Industrial Conservation Program applies to industrial users, which are defined as "a person who uses groundwater withdrawn pursuant to a Type 1 or Type 2 non-irrigation grandfathered right (GFR) or a withdrawal permit for an industrial use." Note that if a facility instead obtains water from a water provider, requirements are encompassed in the Municipal Conservation Program.

Within the Industrial Conservation Program, there are separate requirements for steam electric generation or combined-cycle power plants, and for cooling towers associated with combustion turbine power plants. The Coolidge Expansion project would be a combustion turbine peaking power plant. The requirements for a combustion turbine power plant under the Industrial Conservation Program apply only under three conditions:

- ADWR regulates power plants that produce or are designed to produce more than 25 megawatts of electricity.
- ADWR regulates combustion turbine power plants with cooling capacity of 250 tons or more.
- The power plant obtains water under a groundwater right or industrial withdrawal permit, and not from a municipal provider.

However, while the Coolidge Expansion project would produce more than 25 megawatts, peaking plants are specifically not included in this category. The existing Coolidge Generating Station is identified in the Fourth Management Plan and is noted not to be included: "In addition, there is a peaking plant in [Pinal AMA] that does not meet the definition of a Large-scale Power Plant." (ADWR 2020)

Because the Coolidge Expansion project is a peaking plant, the specific requirements for combustion turbine power plants are not applicable. As a general industrial user, the Coolidge Expansion project would have to comply with general conservation requirements outlined in the Industrial Conservation Program (§ 6-602). These include the following:

1. Avoid waste and make diligent efforts to recycle water.
2. Do not use water for non-residential single-pass cooling or heating purposes, unless the water is reused for other purposes.
3. Use low-flow plumbing fixtures.
4. Use plants listed in the ADWR Low Water Use/Drought Tolerant Plant List for the Pinal AMA for landscaping to the maximum extent feasible and use a water-efficient irrigation system.
5. Do not serve or use groundwater for the purpose of watering landscaping plants within any publicly owned right-of-way of a highway, street, road, sidewalk, curb, or shoulder which is used for travel in any ordinary mode, including pedestrian travel, unless the plants are listed in ADWR's Low Water Use/Drought Tolerant Plant List for the Pinal AMA.
6. Do not serve or use groundwater for the purpose of maintaining water features, including fountains, waterfalls, ponds, water courses, and other artificial water structures, within any publicly owned right-of-way of a highway, street, road, sidewalk, curb, or shoulder which is used for travel in any ordinary mode, including pedestrian travel.

Specific Management Direction for Municipal Water Suppliers

The nearby area is served by Arizona Water Company. Arizona Water Company is considered a municipal water supplier by ADWR under the Fourth Management Plan, and as such must comply with the Municipal Conservation Program. Part of the Municipal Conservation Program is that entities known as "individual users" have specific conservation requirements. Specific individual user requirements are identified for turf-related facilities, public rights-of-way, and large cooling towers not belonging to a power facility. If water were obtained from Arizona Water Company, the proposed project does not have specific individual user requirements under the Municipal Conservation Program. However, Arizona Water Company still has specific conservation requirements for the overall system, and if obtaining water from Arizona Water Company, the Coolidge Expansion project may be required to meet other conservation requirements and best management practices implemented by Arizona Water Company.

Future Projections within the Pinal AMA

ADWR has a long history of assessing groundwater conditions in the Pinal AMA and projecting groundwater use into the future, starting in 1989 with the first Pinal AMA groundwater flow model (Wickham and Corkhill 1989). The results of the most recent modeling effort by ADWR for Pinal AMA were published in 2019, generally raising concerns about future groundwater supplies in the Pinal AMA (ADWR 2019). This modeling effort projected groundwater conditions through the year 2115 and incorporated all known groundwater demands including groundwater supplies already committed and approved for assured water supplies and recovery of long-term storage credits. Municipal and industrial demands were maintained at 2015 levels, and agricultural demands were projected based on a number of factors. Overall, the combined projections show that annual rates of groundwater pumping decrease somewhat over the next century, but not substantially so.

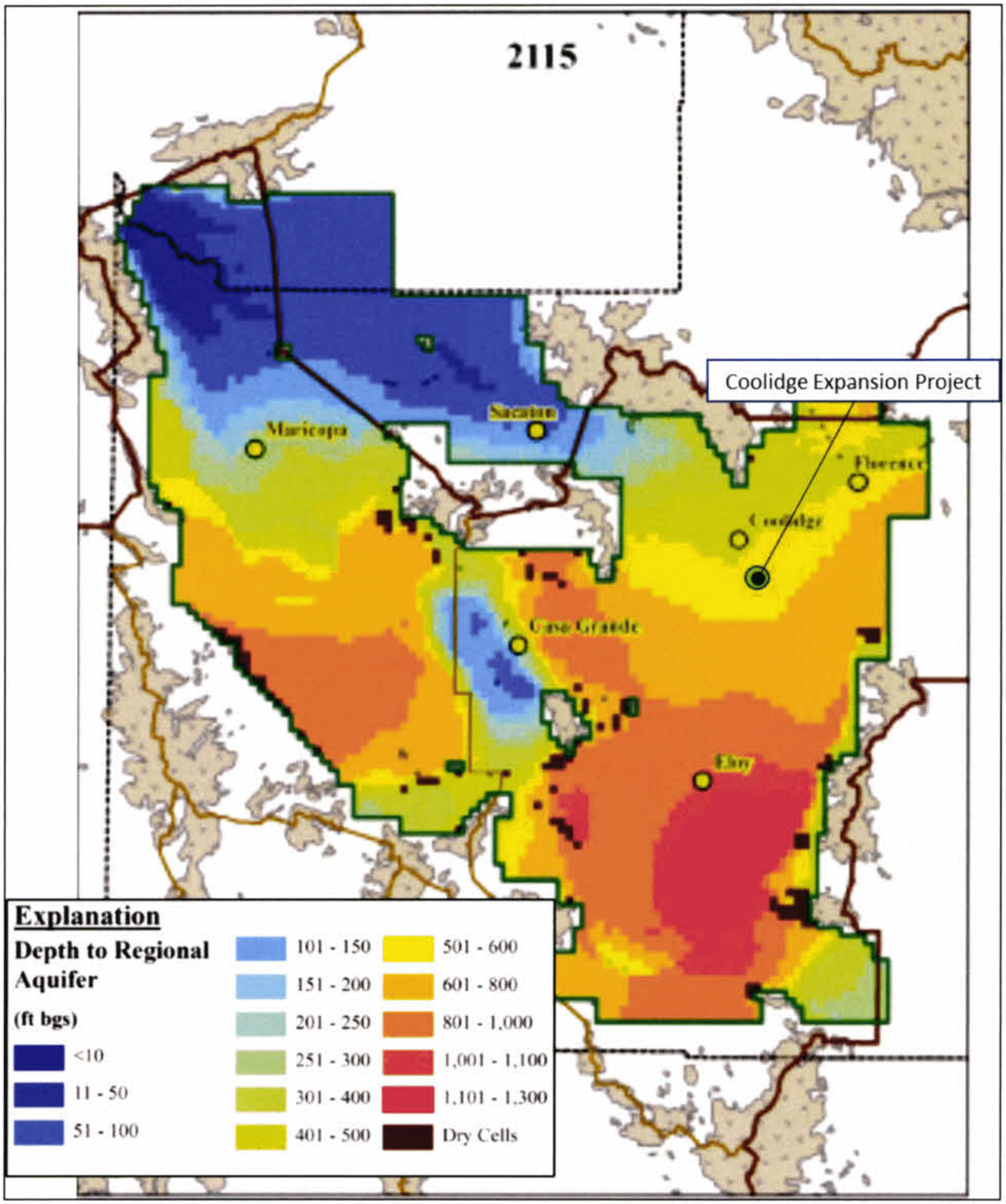

Figure 4. Excerpt from ADWR's 2019 Pinal AMA modeling report, showing predicted depth to groundwater at end of planning period (2115) (ADWR 2019)

The modeling report focused on whether committed or projected water supplies could physically be obtained from the aquifer. The modeling found that of the roughly 80 million acre-feet projected to be required by the year 2115, only 72 million acre-feet were physically available, suggesting that the Pinal AMA may experience a long-term shortfall of 8 million acre-feet (ADWR 2019).

The modeled shortfalls noted are for the Pinal AMA as a whole, and it is important to recognize that because the model is based on physical availability, the specific location of the pumping determines whether a shortfall is anticipated. Most of the critical shortfalls are predicted to occur south of Eloy, roughly 15–20 miles from the project area. By contrast, based on ADWR's modeling for their 100-year planning horizon, in the immediate vicinity of the project the following conditions are anticipated:

- Current (2015) depth to water used in the model = 100–150 feet below ground surface. This is largely consistent with the site-specific information available.
- Projected (2115) depth to water resulting from modeled groundwater demands = 500–600 feet below ground surface.
- Projected (2115) drawdown resulting from modeled groundwater demands = 400–500 feet.
- Remaining saturated thickness of aquifer above 1,110 feet in 2115 = 500–600 feet.

Based on the modeling, groundwater supplies are likely to remain physically available in the vicinity of the project site for ADWR's 100-year planning horizon, with substantial remaining saturated thickness in the aquifer. The life expectancy for the Coolidge Expansion Project is estimated to be 30 years which is a shorter duration than 100 years. In addition, the Coolidge Expansion Project will not contribute to long term shortfall in the Pinal AMA because the water supply will be sourced from long-term storage credits.

Ramifications of Colorado River Supplies and the Drought Contingency Plan

The delivery of surface water from the Colorado River via the CAP is an important source for overall water supplies in the Pinal AMA. With respect to water supplies from the Colorado River, the State of Arizona is currently operating under a Drought Contingency Plan. The Drought Contingency Plan was signed in May 2019 by all seven Colorado River basin states, the U.S. Department of the Interior, and the U.S. Bureau of Reclamation. The provisions of the plan expire in 2026. This plan imposes additional restrictions on the delivery of Colorado River water; these restrictions are in addition to interim guidelines previously agreed to by the seven Colorado River upper and lower basin states.

The Colorado River Compact of 1922 is the foundation of the "Law of the River," which governs Colorado River water management. State apportionments were established in agreements approved subsequent to the Colorado River Compact, and other laws and court decisions have further added to the Law of the River. The Drought Contingency Plan was developed in recognition of ongoing shortages in the Colorado River watershed and is designed to reduce the risks of Lake Mead declining to critical elevations by requiring Arizona, California, and Nevada to contribute additional water to Lake Mead storage at predetermined elevations and creating additional flexibility to incentivize additional voluntary conservation of water to be stored in the lake. These new contributions of water by each lower basin state are an overlay and are in addition to the shortage volumes outlined in the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead (known as the 2007 Guidelines) (U.S. Bureau of Reclamation 2007). Like the shortage elements of the 2007 Guidelines, new contributions would increase as Lake Mead's elevation declines, providing protection against Lake Mead's declining to critically low elevations. The Drought Contingency Plan also provides for the potential recovery of contributions later, should Lake Mead conditions improve significantly.

Every year in August, the U.S. Bureau of Reclamation makes a 24-month projection of anticipated reservoir levels, which in turn determines the level of restrictions that will be in place for the coming year. In August 2021, projections indicated that Lake Mead reservoir water levels (on January 1, 2022) would be at or below 1,075 feet and at or above 1,050 feet (U.S. Bureau of Reclamation 2021). This is the first time that Lake Mead has reached what are known as "Tier 1" conditions in the Drought Contingency Plan. Under these management protocols, Arizona foregoes 512,000 acre-feet of allocated Colorado River water.

These restrictions do not mean the complete absence of Colorado River water for Arizona. Arizona's allocation from the Colorado River is 2.8 million acre-feet, of which one-half is allocated to main-stem users, and the other one-half is accessed by users via the CAP aqueduct. To date, voluntary restrictions under the 2007 Interim Guidelines and Drought Contingency Plan have not greatly impacted individual users, as most of the 192,000 acre-feet of forbearance under Tier 0 shortages came from the excess CAP water pool, which reduced water available for groundwater replenishment activities but avoided drastic effects on contracted users. Under Tier 1 shortages, the reductions would spread more widely and in particular would heavily impact agricultural users in Pinal County (or more specifically, the reductions come from the "CAP Ag Pool" allotment). Within Arizona, passage of the Drought Contingency Plan also provided for mitigation measures (including wet water replacement and financial compensation) that are meant to reduce impacts on end users. In Pinal County, this includes funding to rehabilitate groundwater infrastructure (wells) to increase access to groundwater by those entities that had been using a CAP allotment.

With respect to the Coolidge Expansion project, there are two primary ramifications from the ongoing shortages on the Colorado River:

- The long-term groundwater supply already has been modeled by ADWR to be insufficient over the next 100 years. That modeling was reported in 2019 and appears to assume full delivery of CAP Ag Pool water through 2030. This assumption is now incorrect. This means the groundwater shortage eventually facing users in the Pinal AMA may be worse than that modeled by ADWR and reported in 2019. The overall effect of the CAP reductions will depend on how individual agricultural users respond. For example, some agricultural lands may be fallowed rather than switching to groundwater pumping.
- Shortages of Colorado River water will reduce the amount of water available for underground storage of water (either directly or through groundwater savings facilities) though existing credits would still be available for purchase and use.

EFFECTS OF PROPOSED PROJECT WATER SUPPLY

Proposed Water Supply

The Coolidge Expansion project is estimated to require up to 233 acre-feet per year. Multiple options for obtaining this water supply were considered:

- Previously, the Coolidge Generating Station converted 100 acres of an existing Irrigation Groundwater Right to a Type 1 Non-Irrigation Grandfathered Right (58-111844.0011). An additional 98 acres remain from the original Irrigation Groundwater Right that could be converted. The amount of the new right after the conversion would be determined by ADWR but based on the previous conversion could be assumed to be roughly 273 acre-feet.
- The Coolidge Generating Station has acquired long-term storage credits through the purchase of CAP water delivered to the Hohokam Irrigation District Groundwater Savings Facility. The current long-term storage account balance is approximately 5,600 acre-feet, as well as additional

credits that are stored under SRP's account in the Pinal AMA. To recover this water, an ADWR Recovery Well Permit is required. Well #1 and Well #2 are permitted to recover up to 350 acre-feet per year and up to 717 acre-feet per year, respectively, of water from the long-term storage account. To date, the long-term storage account has not been used, as plant water demand has not exceeded the limit of the existing Type 1 Non-Irrigation Grandfathered Water Right.

- Alternatively, the Coolidge Expansion project could potentially obtain water directly from the Arizona Water Company Pinal Valley system.

After consideration, the second option was selected for the water supply for the Coolidge Expansion project. The water supply will be 100% derived from the recovery of long-term storage credits from the current balance of 5,600 AF and additional credits that are stored under SRP's account in the Pinal AMA. The water will be recovered from wells permitted by ADWR as recovery wells.

Effects of Proposed Water Supply

Reduction of overall groundwater use in Pinal AMA

The selection of long-term storage credits for the water supply for the project is the option that most reduces overall groundwater use in the Pinal AMA. To obtain long-term storage credits, groundwater is either physically recharged into the aquifer, or surface water is delivered to an entity so that entity does not have to pump groundwater under an existing groundwater right. In this case, the long-term storage credits were obtained by delivering CAP water to the Hohokam Irrigation District Groundwater Savings Facility. From a water accounting perspective, this mechanism is equivalent to using the CAP water directly at the facility. In addition, the act of recharging the water through a groundwater savings facility also results in a 5% addition to the aquifer that is not recovered.

Adherence to conservation requirements

As noted above, the Coolidge Expansion project would be considered a general industrial user and would have to comply with general conservation requirements outlined in the Industrial Conservation Program (§ 6-602). The two most substantial of these include the following:

1. Avoid waste and make diligent efforts to recycle water.
2. Do not use water for non-residential single-pass cooling or heating purposes, unless the water is reused for other purposes.

The Coolidge Expansion project does not use single-pass cooling. Overall, water consumption is anticipated to be similar to that of the existing Coolidge Generating Station. Based on reported operational data for 2016–2018, as shown in Table 3, the average water use (as measured in gallons per megawatt hour [MWh]) is substantially less than that for other generating plants in Arizona, as well as nationwide.

Table 3. Typical Water Use by Coolidge Generating Station, Compared to Averages

Year	Reported water use (acre-feet)*	Reported water use (milligal)	Reported generation (MWh)†	Calculated water use (gallons) per MWh
2020	198.41	64.7	499,566	129
2019	125.86	41.0	330,191	124

Year	Reported water use (acre-feet)*	Reported water use (milligal)	Reported generation (MWh)†	Calculated water use (gallons) per MWh
2018	64.22	20.9	155,333	135
2017	71.69	23.4	167,265	140
2016	72.22	23.5	167,695	140
Arizona Average‡				825
National Average¶				2,050

Notes:

* As reported to ADWR for groundwater right 58-111844.011 (ADWR 2021d)

† As reported to U.S. Energy Information Administration (USEIA) (2021a)

‡ As reported to USEIA (2021b); based on 2019 June usage reported for 18 natural gas power plants in Arizona

¶ As reported to USEIA (2021c); based on 2019 June usage reported for 418 natural gas power plants across the United States

Physical Availability of Groundwater

From a regulatory perspective, while the groundwater being used is considered to be water recovered from a groundwater savings facility, the groundwater must still be physically available at the point of recovery. Physically, this groundwater is available at the project site and under the most recent projections would remain physically available through 2115 even with substantial projected groundwater drawdown of 400 to 500 feet in the vicinity of the project. However, one ramification of these falling water levels is that water quality may substantially deteriorate as wells are deepened to access poor-quality groundwater below depths of 600 feet. This could require treatment prior to use or could reduce the available cycles before blowdown.

CONCLUSIONS

1. The Pinal AMA is an area of intensive groundwater use and is anticipated to experience substantial groundwater demands over the next 100 years, resulting in shortfalls within the basin overall.
2. The water supply selected for the proposed Coolidge Expansion project is the most sustainable of the options available, and would reduce groundwater use for the property site within the Pinal AMA.
3. The proposed plant would meet the conservation requirements under the Industrial Conservation Program and would use substantially less water than other similar facilities.
4. The recovered groundwater is physically available at the facility and is anticipated to be physically available based on modeled water conditions over the next 100 years.

LITERATURE CITED

AMEC Earth & Environmental, Inc. 2009. Exploration Analysis Report, Coolidge Generating Station, Exploratory Boring Program, Pinal County, Arizona. AMEC Project No. 08-115-05005. January 26.

Arizona Department of Water Resources (ADWR). 1991. Second Management Plan, 1990–2000, Pinal Active Management Area. January.

———. 1999. Third Management Plan, 2000–2010, Pinal Active Management Area. December.

———. 2019. 2019 Pinal Model and 100-Year Assured Water Supply Projection Technical Memorandum. October 11.

———. 2020. Pinal Active Management Area, Fourth Management Plan. December 14.

———. 2021a. Registry of Wells in Arizona (55-files). Available at: https://gisweb3.azwater.gov/WellReg. Accessed September 10, 2021.

———. 2021b. Groundwater Site Inventory. Available at: https://gisweb3.azwater.gov/gwsi. Accessed September 10, 2021.

———. 2021c. Total Land Subsidence in the Eloy Sub-Basin, Pinal County, Based on Radarsat-2 Satellite Interferometric Synthetic Aperture Radar (InSAR) Data, Time Period of Analysis: 11.0 Years, 05/15/2010 to 04/11/2021. Available at: https://new.azwater.gov/sites/default/files/PicachoArea05-2010to04-2021_8x11.pdf. Accessed October 13, 2021.

———. 2021d. Annual Water Withdrawal and Use Report, Groundwater Right 58-111884.0011. Available at: https://infoshare.azwater.gov/docushare/dsweb/HomePage. Accessed October 13, 2021.

Liu, S., K. Nelson, D. Yunker, W. Hipke, and F. Corkhill. 2014. Regional Groundwater Flow Model of the Pinal Active Management Area, Arizona, Model Update and Calibration. Arizona Department of Water Resources Model Report No. 26. February.

Richard, S.M., T.C. Shipman, L.C. Greene, and R.C. Harris. 2007. Estimated Depth to Bedrock in Arizona. Arizona Geological Survey Digital Geologic Map Series DGM-52, Version 1.0.

Schlumberger Water Services. 2011. Transcanada Coolidge Power, Well Drilling Report. Report No. 2873. March.

U.S. Bureau of Reclamation. 2007. Record of Decision: Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead: Final Environmental Impact Statement. Washington, D.C.: U.S. Bureau of Reclamation. December 13.

———. 2021. Operation Plan for Colorado River System Reservoirs, August 2021 24-Month Study. August.

U.S. Energy Information Administration (USEIA). 2021a. Open Data Access Portal for Coolidge Generation Station, Net Generation, Annual. Available at: https://www.eia.gov/opendata/qb.php?category=6968&sdid=ELEC.PLANT.GEN.56948-ALL-ALL.A. Accessed October 13, 2021.

———. 2021b. Thermoelectric cooling water data. Available at: https://www.eia.gov/electricity/data/water/. Accessed October 13, 2021.

Wickham, M.P., and E.F. Corkhill. 1989. Pinal Active Management Area Regional Groundwater Flow Model Phase One: Hydrogeologic Framework, Water Budget and Phase One Recommendations. Arizona Department of Water Resources Modeling Report Number 1.

World Health Organization. 2017. Guidelines for Drinking-water Quality. Fourth Edition Incorporating the First Addendum.

APPENDIX A

Combined Records from ADWR Well Registry and Groundwater Site Inventory within Approximately 1 Mile of Project Area

Table A-1. Combined Records from ADWR Well Registry and Groundwater Site Inventory (GWSI) within Approximately 1 Mile of Project Area

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
Well #1		D-06-08-10ADD	218256	COOLIDGE POWER LLC		154	620	658	18		5/12/2009	
Well #2		D-06-08-10ADD	218257	COOLIDGE POWER LLC		154	640	620	18		5/4/2010	
Well #3		D-06-08-10ADD	218942	COOLIDGE POWER LLC								
Index Well	325503111284801	D-06-08 11ADA1	617559	PINAL LAND HOLDNGS, LLC	11/12/2020	73.2	365		18	UNUSED	6/15/1951	
Index Well	325554111305201	D-06-08 S04ADD1	605731	BRIGHTON 875, LLC	11/12/2020	70.7	600	600	20	UNUSED	9/27/1939	0
	325500111305501	D-06-08 09ADD			1/6/2014	76.9	400		16	UNUSED	12/6/1956	
	325432111314301	D-06-08 09CCD	605689	PINAL LAND HOLDINGS	12/3/2003	76.8	468	430	20	IRRIGATION	1/1/1949	500
	325447111305401	D-06-08 09DAD	605354	BARTLETT FARMS INC.	1/7/2019	76.2	700	16	20	UNUSED	1/1/1955	900
	325431111311801	D-06-08 09DCC	605357	BARTLETT FARMS INC.	1/7/2019	88.8	504	700	20	IRRIGATION	4/27/1946	800
	325439111305601	D-06-08 09DDA1	605355	BARTLETT FARMS INC.	11/9/1988	59.8	84	0	12	UNUSED	1/1/1935	0
	325439111305501	D-06-08 09DDA2	605356	BARTLETT FARMS INC.	12/18/2013	70.9	450	14	20	IRRIGATION	1/1/1935	400
	325429111310601	D-06-08 09DDC	605346	BARTLETT FARMS INC.	11/7/1988	127.9	700	700	16	IRRIGATION	12/30/1980	800
	325458111295101	D-06-08 10ADD	617778	COOLIDGE POWER LLC	11/4/1998	59.3	806	400	20	IRRIGATION	8/6/1956	1,180
	325458111304001	D-06-08 10BCA			12/18/2013	54.3	500		16	UNUSED	2/1/1947	
	325429111301901	D-06-08 10DCC	617779	PINAL LAND HOLDINGS, LLC	1/8/2019	91.4	1,330		20	UNUSED	4/22/1961	
	325440111295301	D-06-08 10DDA	617774	MCFARLAND, BC	1/10/1994	74.7	450		20	DOMESTIC	1/1/1940	
	325431111300101	D-06-08 10DDC	617780	PINAL LAND HOLDINGS, LLC	12/3/2003	67.6	800	176	20	UNUSED	6/9/1954	
	325507111291801	D-06-08 11ACB	617557	PINAL LAND HOLDNGS, LLC	11/4/1998	91.5	600		20	IRRIGATION	3/14/1961	
	325503111285001	D-06-08 11ADA2	617558	PINAL LAND HOLDNGS, LLC						IRRIGATION		

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
	325500111285901	D-06-08 11ADC	617560	PINAL LAND HOLDNGS, LLC			1216		20	IRRIGATION	5/4/1959	
	325440111284901	D-06-08 11DDA	617561	PINAL LAND HOLDNGS, LLC	1/9/2019	63.1	500		12	UNUSED	7/1/1950	
	325439111284901	D-06-08 11DDD	617562	PINAL LAND HOLDINGS, LLC	1/9/2019	243.6	300		12	IRRIGATION	1/1/1951	
	325342111294701	D-06-08 14CCC	625234	PINAL LAND HOLDNGS, LLC	11/8/2017	108.8	450	450	20	IRRIGATION	5/1/1953	600
	325348111292401	D-06-08 14CDA			1/13/1958	109.49	225			UNUSED	2/1/1950	
	325342111290401	D-06-08 14DCD1	504821	COOPER, TJ	11/12/1993	104	360	360	6	DOMESTIC	12/4/1983	20
	325339111302001	D-06-08 15DCC	625235	PINAL LAND HOLDNGS, LLC	11/8/1988	89.9	186	400	20	UNUSED	4/1/1944	500
	325428111305301	D-06-08 16AAA	615428	AZ STATE LAND DEPT.	1/7/2019	90.8	630	600	16	IRRIGATION	4/21/1971	750
	325405111310501	D-06-08 16ADC	615429	AZ STATE LAND DEPT.	1/7/2019	88.1	400	600	20	IRRIGATION	1/12/1950	750
	325403111305301	D-06-08 16ADD	615430	AZ STATE LAND DEPT.	1/7/2019	93	600	600	20	IRRIGATION	1/1/1960	100
	325405111313601	D-06-08 16BDC1	605686	PINAL LAND HOLDINGS, LLC			320	480	20	IRRIGATION	1/1/1933	500
	325407111320701	D-06-08 16BDC2	605687	ANDREW & JOELLA FERGUSON	12/5/2007	81.4	395	593	20	UNUSED	3/11/1950	800
	325403111312301	D-06-08 16BDD	605688	PINAL LAND HOLDINGS, LLC			600	600	16	IRRIGATION	1/1/1959	800
	325337111312401	D-06-08 16CDD	615432	AZ STATE LAND DEPT.	1/7/2019	103.1	910	900	20	IRRIGATION	6/9/1978	1,000
	325340111313701	D-06-08 16DCD					229		16	UNUSED	1/1/1933	
	325630111284901	D-06-08 N02DAD					300			IRRIGATION		
	325605111285801	D-06-08 N02DCA	610585	PINAL LAND HOLDINGS, LLC	12/16/2013	111.3	490	190	20	IRRIGATION	2/7/1950	800
	325624111284701	D-06-08 N02DDA	610584	PEN, JOHN & LOIS	12/4/2013	120.1	402	400	20	IRRIGATION	2/10/1952	450
	325641111295101	D-06-08 N03DAA	605240	KELLY & MEGAN FREEMAN	12/3/2007	91.7	352	300	20	IRRIGATION	7/18/1951	800
	325640111295001	D-06-08 N03DDA	605241	KELLY & MEGAN FREEMAN	1/11/2019	59.2	2,305	2,305	18	UNUSED	4/10/1964	1,000

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
	325640111295101	D-06-08 N03DDD			12/16/2013	88.2	400		20	UNUSED	2/23/1940	
	325628111305401	D-06-08 N04DAD			12/19/2013	59.7	400		16	UNUSED	6/10/1961	
	325551111305501	D-06-08 N04DDD			5/1/1951	89	235			IRRIGATION	5/1/1951	
	325559111292301	D-06-08 S02BDA	617563	PINAL LAND HOLDINGS, LLC	1/11/2019	77.8	365		20	IRRIGATION	1/27/1947	
	325550111292001	D-06-08 S02BDD			1/11/2019	59.4	250		20	UNUSED	1/1/1929	
	325525111291901	D-06-08 S02CDD	617775	MCFARLAND, BC	1/11/2019	64.3			20	UNUSED		
	325532111285201	D-06-08 S02DAA	617565	PINAL LAND HOLDNGS, LLC	11/12/2020	254.8	250		20	IRRIGATION	1/1/1929	
	325531111285301	D-06-08 S02DAD	617777	PINAL LAND HOLDNGS, LLC	11/8/2010	106.5	700		20	IRRIGATION	10/23/1948	
	325526111284801	D-06-08 S02DDD	617776	PINAL LAND HOLDNGS, LLC	12/16/2013	82.6				IRRIGATION		
	325547111295301	D-06-08 S03ADD	605237	A. WAYNE & HELEN L. FREEMAN	1/11/2019	83.5	380	360	20	IRRIGATION	11/18/1950	700
	325614111302101	D-06-08 S03BAA	605347	BARTLETT FARMS INC.	8/21/1996	107	500	500	20	UNUSED	1/1/1946	800
	325603111303601	D-06-08 S03BBD			11/10/1998	63.4	700		20	IRRIGATION	9/1/1957	
	325548111303401	D-06-08 S03BDC	605349	BARTLETT FARMS INC.	1/7/2019	87	600	600	20	UNUSED	1/1/1950	800
	325550111302101	D-06-08 S03BDD1			11/7/1988	80.5	250		20	UNUSED	1/1/1940	
	325549111302101	D-06-08 S03BDD2	605348	BARTLETT FARMS INC.	12/5/2007	82.5	2500	1,800	20	UNUSED	2/23/1956	1,600
	325547111302401	D-06-08 S03CAA					388		20	UNUSED		
	325531111303601	D-06-08 S03CCA	605352	BARTLETT FARMS INC.	12/5/2007	82.4	600	600	16	IRRIGATION	1/1/1975	600
	325524111305601	D-06-08 S03CCD			1/7/2019	81.6	516		20	IRRIGATION	3/13/1950	
	325522111301501	D-06-08 S03DCC	605238	A. WAYNE & HELEN L. FREEMAN	1/7/2019	83	800	800	20	UNUSED	1/1/1956	700
	325524111300701	D-06-08 S03DCD	809361	KELLY FREEMAN		230	570	570	16	UNUSED	4/1/1963	

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
	325532111295101	D-06-08 S03DDA	605239	A. WAYNE & HELEN L. FREEMAN	1/11/2019	94.4	460	300	20	IRRIGATION	4/1/1948	700
	325524111295201	D-06-08 S03DDD	605242	PETERSON, GE	1/13/1977	144.7	310	300	20	DOMESTIC	1/1/1918	10
	325612111305301	D-06-08 S04AAA1	605735	EVERGREEN-PYRAMID HIGHWAY CORNERS, LLC		175	414	414	16	UNUSED	1/1/1958	300
	325608111305301	D-06-08 S04AAA2	605733	EVERGREEN-PYRAMID HIGHWAY CORNERS, LLC		175	300	300	16	IRRIGATION	1/1/1962	850
	325609111305301	D-06-08 S04AAA3	605737	BRIGHTON 875, LLC	12/19/2013	71.1	400	380	16	UNUSED	1/1/1970	500
	325549111310401	D-06-08 S04ADC1			1/3/2019	80.7	375		20	UNUSED	1/9/1947	
	325548111310401	D-06-08 S04ADC2	501562	BRIGHTON 875, LLC	12/19/2013	72.7	340	340	16	IRRIGATION	4/1/1982	575
	325548111305601	D-06-08 S04ADD2	605738	BRIGHTON 875, LLC	11/10/1998	64.2	402	402	16	IRRIGATION	12/28/1969	600
	325549111312301	D-06-08 S04BDD1	605734	OWENS MORTGAGE INVESTMENT FUND	11/10/1998	67.2	312	312	20	IRRIGATION	3/1/1954	450
	325549111312901	D-06-08 S04BDD2	605736	OWENS MORTGAGE INVESTMENT FUND	11/10/1993	88.6	385	366	16	IRRIGATION	6/24/1959	500
	325522111310701	D-06-08 S04DCD	606013	BRIGHTON 875, LLC	12/19/2013	54.5	500	500	20	UNUSED		700
	325534111305701	D-06-08 S04DDA	606012	BRIGHTON 875, LLC	11/10/1993	87.9	600	600	16	IRRIGATION	8/5/1966	700
	325523111305701	D-06-08 S04DDD1	606011	STEARNS BANK, NA	2/26/1942	55.2	460	460	20	DOMESTIC	1/1/1939	300
	325522111305601	D-06-08 S04DDD2	606017	STEARNS BANK, NA			500		20	IRRIGATION		180
	325522111305801	D-06-08 S04DDD3	606010	BRIGHTON VILLAGE LANDBANK, LLC	3/18/1985	215.9	600	600	20	IRRIGATION	1/1/1977	600
	325639111284801	D-06-08-02AAA	610583	PINAL LAND HOLDINGS, LLC		153	1,440	1,297	13		5/3/2003	1,950
		D-06-08-02ADD	533191	SW GAS CORP.		0	230	0	0		10/22/1991	0
		D-06-08-02CAC	617564	PINAL LAND HOLDNGS, LLC		0	0	0	0			0

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
		D-06-08-03000	907688	EL PASO NATURAL GAS, ATTN: WILLIAM BALTZ		59	60	60	8		8/29/2007	
		D-06-08-03ADA	605236	KELLY & MEGAN FREEMAN		160	300	300	20		1/1/1947	700
		D-06-08-03BAD	605350	BARTLETT FARMS INC.		300	200	200	20		1/1/1940	0
		D-06-08-03BBB	527351	SOUTHWEST GAS CORP.		0	228	0	0		5/6/1990	0
		D-06-08-03BBD	605351	BARTLETT FARMS INC.		300	700	700	20		1/1/1950	800
		D-06-08-03CCC	620627	HANNAH, E		170	400	400	12		1/1/1974	35
		D-06-08-03CCC	620628	HANNAH, E		170	230	230	6		1/1/1950	20
		D-06-08-03CCD	605353	BARTLETT FARMS INC.		300	500	500	20		1/1/1935	600
		D-06-08-03CDC	201338	SALT RIVER PROJECT		0	250	80	6		12/15/2003	
		D-06-08-03CDC	230281	EL PASO NATURAL GAS CO. LLC. A KINDER MORGAN COMPANY			500	500	13		5/28/2019	
		D-06-08-03CDC	908684	EL PASO NATURAL GAS COMPANY		125	410	410	6		4/1/2008	30
		D-06-08-03DDD	805408	N.S.K. & B. PRTSHP.		0	350	240	20		12/31/1955	35
		D-06-08-04AB0	516243	SIMPSON, RHYNE JR.		0	20	0	6		1/13/1987	0
		D-06-08-04ADC	605732	BRIGHTON 875, LLC		165	375	375	16		4/15/1982	550
		D-06-08-09ADD	213269	ADEQ (ATTN: SAMAR BHUYAN)		43	55	53	2		9/28/2006	
		D-06-08-09ADD	213270	ADEQ (ATTN: SAMAR BHUYAN)		43	55	53	2		9/27/2006	
		D-06-08-09ADD	213271	ADEQ (ATTN: SAMAR BHUYAN)		43	55	53	2		9/28/2006	

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
		D-06-08-09ADD	213272	ADEQ (ATTN: SAMAR BHUYAN)		43	55	53	2		9/27/2006	
		D-06-08-09ADD	595761	ADEQ (ATTN: SAMAR BHUYAN)		41	57	54	2		8/26/2003	
		D-06-08-09ADD	595763	ADEQ (ATTN: SAMAR BHUYAN)		36	50	50	4		11/22/2002	
		D-06-08-09ADD	595766	ADEQ (ATTN: SAMAR BHUYAN)		36	50	50	4		11/21/2002	
		D-06-08-09ADD	908223	ADEQ (ATTN: SAMAR BHUYAN)		43	56	55	2		12/13/2007	
		D-06-08-09ADD	908224	ADEQ ATTN: SAMAR BHUYAN)		43	56	55	2		12/13/2007	
		D-06-08-09ADD	908225	ADEQ (ATTN: SAMAR BHUYAN)		43	57	55	5		12/14/2007	
		D-06-08-09ADD	917235	ADEQ		35	40	40			8/21/2014	
		D-06-08-09CCD	533192	SW GAS CORP.		0	230	0	0		10/22/1991	0
		D-06-08-09DDA	595758	ADEQ (ATTN: SAMAR BHUYAN)		36	50	50	4		11/27/2002	
		D-06-08-10000	910661	WESTERN EMULSIONS, INC.		23	30		8		4/23/2009	
		D-06-08-10000	923943	EDP RENEWABLES NORTH AMERICA LLC (ATTN: ERIC DESMARALS)			40				2/28/2020	
		D-06-08-10ABB	525240	SUNBELT REFINING CO.		0	0	0	0			0
		D-06-08-10ABC	524748	SUNBELT REFINING CO.		0	35	0	10		6/13/1989	0
		D-06-08-10ACA	218940	COOLIDGE POWER LLC								
		D-06-08-10ACB	218941	COOLIDGE POWER LLC								

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		D-06-08-10B00	910128	COOLIDGE POWER, LLC ATTN: JOHN CASSADY								
		D-06-08-10BAB	524747	SUNBELT REFINING CO.		30	36	7	6		6/13/1989	0
		D-06-08-10BAC	522760	COOLIDGE LAND ACQUISITION COMPANY, LLC		0	0	0	0			0
		D-06-08-10BAC	524749	SUNBELT REFINING CO.		20	30	7	6		6/12/1989	0
		D-06-08-10BAD	522759	COOLIDGE LAND ACQUISITION COMPANY, LLC		180	493	493	12		1/29/1989	137
		D-06-08-10BAD	525241	SUNBELT REFINING CO.		18	30	30	2		8/7/1989	0
		D-06-08-10BCA	624101	TGF PROPERTIES LLC		250	600	600	20		1/1/1945	600
		D-06-08-10BCC	202727	ADEQ (ATTN: SAMAR BHUYAN)		40	59	59	4		3/25/2004	
		D-06-08-10BCC	640485	MOORE, M		0	0	0	0			0
		D-06-08-10BDB	217827	COOLIDGE POWER CORPORATION								
		D-06-08-10BDB	217828	COOLIDGE POWER CORPORATION								
		D-06-08-10CBC	536634	SW GAS CORP.		50	230	0	0		10/6/1992	0
		D-06-08-11AAA	805285	MCFARLAND, BONNYE,C		10	0	0	0		12/31/1929	0
		D-06-08-11CCA	530066	VAIL 160 LLC		80	300	300	10		11/30/1990	0
		D-06-08-11DDD	518655	CONNOLLY INVEST CORP.		0	0	0	0			0
		D-06-08-11DDD	523310	CONNOLLY INVEST CORP.		0	0	0	0			0
		D-06-08-14ADD	227270	EL PASO NATURAL GAS COMPANY LLC			500				7/2/2017	

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		D-06-08-14ADD	550668	EL PASO NATURAL GAS CO. LLC., A KINDER MORGAN COMPANY		0	500	114	8		9/17/1995	0
		D-06-08-14DCA	507832	COOPER, THEODORE,J		160	440	260	6		4/30/1984	15
		D-06-08-14DCB	507871	JEFFREY SCOTT MARTIN		180	350	350	6		4/27/1984	10
		D-06-08-15CAA	202084	AARON ZOBRIST								
		D-06-08-15CAB	203457	SUNCRAFT CONSTRUCTION LLC								
		D-06-08-15CAC	596799	STEVE & KATHY BOWERS		104	355	355	7		5/31/2003	20
		D-06-08-15CAD	205740	DANIEL & ELISA SALAZAR								
		D-06-08-15CCC	909949	SCOTT E. & CINDY L. CASLER		132	390	390	6		10/26/2008	20
	325336111303901	D-06-08-15CCD	618029	PROLER INTERNTL CORP.		320	520	520	20		11/20/1976	500
		D-06-08-15CDD	596744	JOHN & ROSE LAXAMANA		105	385	385	7		3/10/2003	
		D-06-08-15CDD	915090	CASEY AND CYBIL GREEN		95	408	408	5		12/13/2013	20
		D-06-08-16ACC	610752	D E S		340	600	600	16		1/1/1960	750
		D-06-08-16ADB	482515	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		1/1/2000	
		D-06-08-16ADB	569533	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT		73	90	90	4		8/4/1998	
		D-06-08-16ADB	571851	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT								
		D-06-08-16ADB	571852	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			90	90	4			

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
		D-06-08-16ADB	571853	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			90	90	4			
		D-06-08-16ADB	571854	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			90	90	4			
		D-06-08-16ADB	571855	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			90	90	4			
		D-06-08-16ADB	580675	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			75				5/23/2000	
		D-06-08-16ADB	595852	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		1/21/2003	
		D-06-08-16ADB	595854	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		1/20/2003	
		D-06-08-16ADB	595856	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		1/17/2003	
		D-06-08-16ADB	595857	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		1/22/2003	
		D-06-08-16ADB	595859	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		1/16/2003	
		D-06-08-16ADB	595861	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			65	65	4		4/24/2003	
		D-06-08-16ADB	595863	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			80	80	2		1/23/2003	

Shown on Figure 3	GWSI ID	Cadastral location	Well Reg. ID	Owner Name	Date of Most Recent GWSI Water Level	Depth to Water (feet)*	Well Depth (feet)	Casing Depth (feet)	Casing Diameter (inches)	Well Use	Date Drilled	Pumping Rate (gpm)
		D-06-08-16ADB	595865	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			80	80	2		1/23/2003	
		D-06-08-16ADB	595866	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			80	80	2		1/23/2003	
		D-06-08-16ADB	595867	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			80	80	2		1/16/2003	
		D-06-08-16ADB	595868	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			80	80	2		1/15/2003	
		D-06-08-16ADB	595871	ARIZONA DEPARTMENT OF ADMINISTRATION RISK MANAGEMENT			80	80	2		1/14/2003	
		D-06-08-16ADD	610751	D E S		240	600	600	20		1/1/1960	100
		D-06-08-16BBA	592290	STATE OF ARIZONA		68	110	110	5		5/28/2002	
		D-06-08-16CAA	610753	ECONOMIC SECURITY		240	600	600	20		12/31/1970	750
		D-06-08-16CCA	610755	ECONOMIC SECURITY		200	600	600	20		12/31/1965	1,000
	325343111312301	D-06-08-16CCC	615431	AZ STATE LAND DEPT.		200	600	600	20		1/1/1965	1,000
		D-06-08-16CDD	610754	D E S		245	900	900	20		3/1/1977	1,000

Source: ADWR (2021a, 2021b)

* Water level shown represents GWSI water level, if available. Otherwise, water level represents information from ADWR well registry files, which typically is the water level when drilled.

APPENDIX B

Representative Long-Term Hydrographs

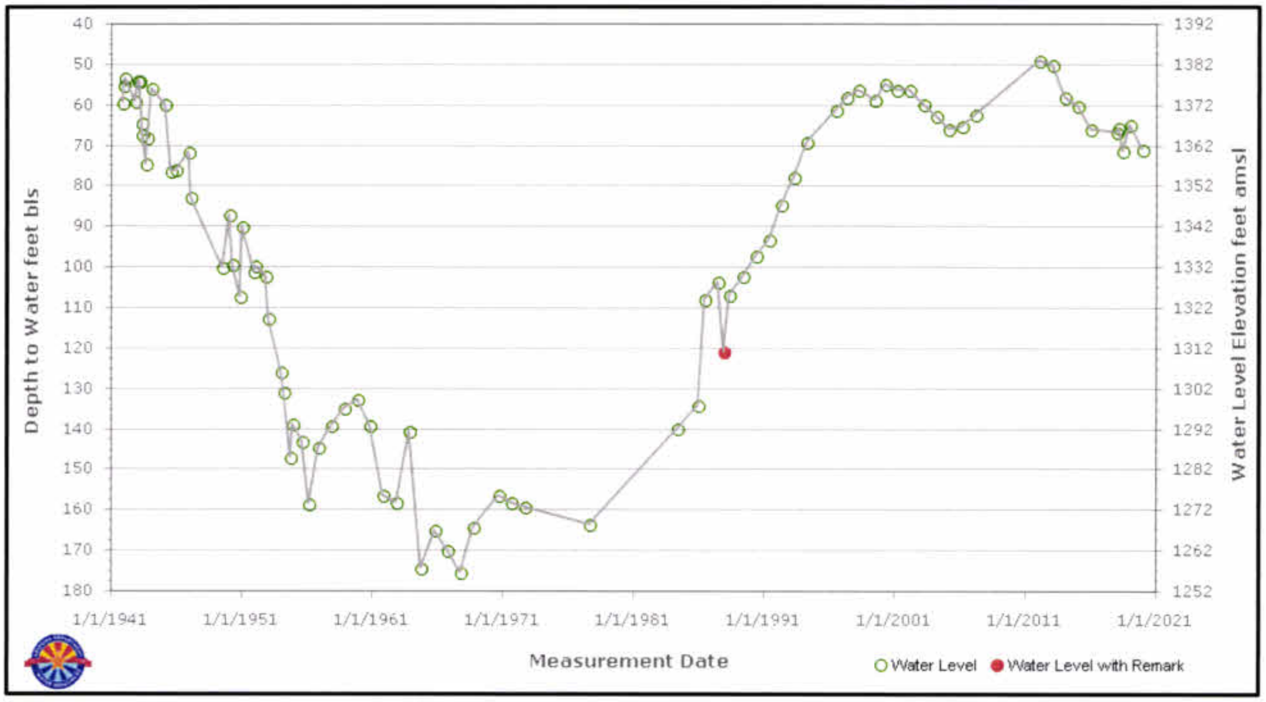

Figure B-1. Hydrograph of water levels in GWSI Well Site 325554111305201 (located approximately 1 mile northwest of the project area).

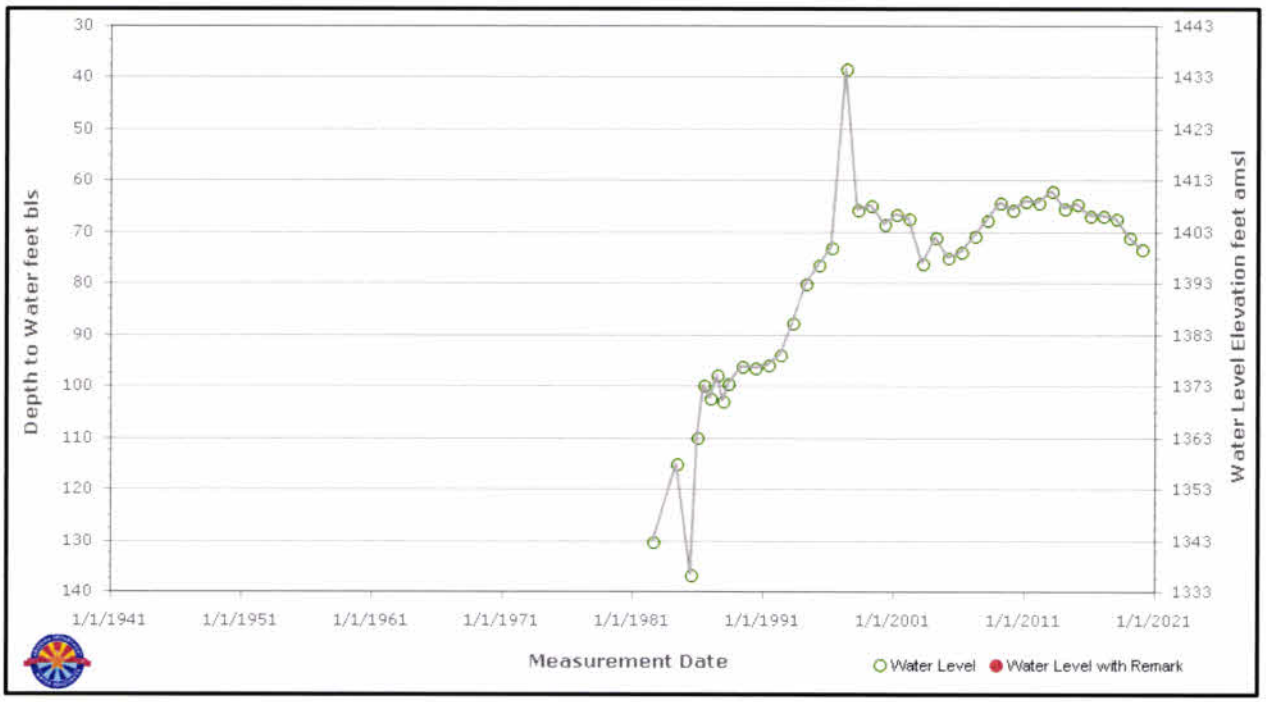

Figure B-2. Hydrograph of water levels in GWSI Well Site 325503111284801 (located approximately 1 mile east of the project area).

APPENDIX C

Land Subsidence Occurring in the Project Area Between 2010 and 2021

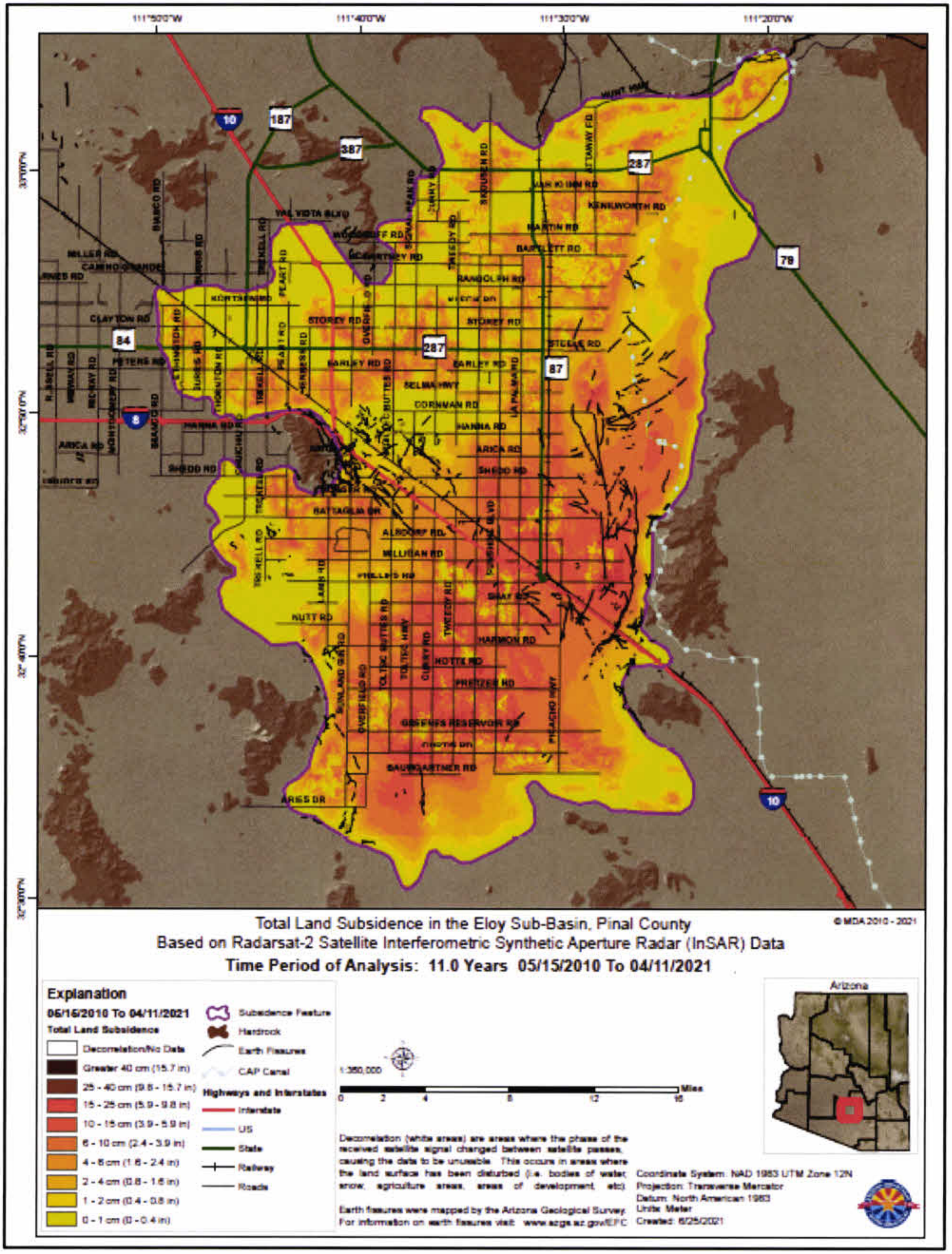
Total Land Subsidence in the Eloy Sub-Basin, Pinal County
Based on Radarsat-2 Satellite Interferometric Synthetic Aperture Radar (InSAR) Data
Time Period of Analysis: 11.0 Years 05/15/2010 To 04/11/2021
© MDA 2010 - 2021
Explanation
05/15/2010 To 04/11/2021
Total Land Subsidence
Decorrelation/No Data
Greater 40 cm (15.7 in)
25 - 40 cm (9.8 - 15.7 in)
15 - 25 cm (5.9 - 9.8 in)
10 - 15 cm (3.9 - 5.9 in)
6 - 10 cm (2.4 - 3.9 in)
4 - 6 cm (1.6 - 2.4 in)
2 - 4 cm (0.8 - 1.6 in)
1 - 2 cm (0.4 - 0.8 in)
0 - 1 cm (0 - 0.4 in)
Subsidence Feature
Hardrock
Earth Fissures
CAP Canal
Highways and Interstates
Interstate
US
State
Railway
Roads
1:350,000
0 2 4 8 12 16 Miles
Decorrelation (white areas) are areas where the phase of the received satellite signal changed between satellite passes, causing the data to be unusable. This occurs in areas where the land surface has been disturbed (i.e. bodies of water, snow, agriculture areas, areas of development, etc).
Earth fissures were mapped by the Arizona Geological Survey. For information on earth fissures visit: www.azgs.az.gov/EFC
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter
Created: 6/25/2021
Arizona

EXHIBIT C – AREAS OF BIOLOGICAL WEALTH

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219: Describe any areas in the vicinity of the proposed site or route which are unique because of biological wealth or because they are habitats for rare and endangered species. Describe the biological wealth or species involved and state effects, if any, the proposed facilities will have thereon.

Introduction

Areas of biological wealth and the rare and endangered species that may occur at or in the vicinity of the Project were identified through a biotic resource review conducted by SWCA Environmental Consultants (SWCA). The data sources consulted for the review include:

- Topographical and aerial maps and land use, land cover, and elevation data
- The U.S. Fish and Wildlife Service (USFWS) species list for Project obtained from the USFWS online Information for Planning and Consultation (IPaC) system (Exhibit C-1)
- Species information obtained from the USFWS Environmental Conservation Online System, the USFWS Arizona Ecological Services document library, and the Arizona Game and Fish Department (AGFD) Online Environmental Review Tool (Exhibit C-2)
- AGFD review of the SRP Coolidge Generating Station-Coolidge Expansion Project (Exhibit C-3)

The AGFD Online Environmental Review Tool database query establishes a buffer beyond the Project Area to search for occurrence records and the presence of modeled habitat. The size of the buffer depends on the type of project being considered. For this Project, the buffer is 5 miles beyond the Project Area as defined by the AGFD Online Environmental Review Tool. This buffer fully encompasses the Study Area.

In addition, an SWCA biologist with expertise in the biology of flora and fauna of the region completed a survey of the Project Area, though the fenced in portion comprising the existing generating station was not entered. All plant and wildlife species observed in the Project Area during surveys on May 25, 2021, were recorded (see Exhibit D for a complete list), and the site was assessed to determine if habitat features for species protected under the federal, state, or local regulations were present in the Project Area and vicinity.

Laws and Policies

Applicable laws and policies regarding special-status species in Arizona include the following:

- The USFWS administers the Endangered Species Act of 1973 (ESA), as amended. The ESA protects wildlife species listed as threatened or endangered from "take" (generally, directly, or indirectly harming or disturbing listed species). However, the ESA does not provide the same take protections for listed plant species, except on federal land. The ESA also allows for the designation of critical habitat for listed species, although designation of critical habitat is not required. Critical habitat is an administrative designation of a defined area with specific characteristics important to the survival and recovery of a listed species. Designation of critical habitat can affect federal actions but not state or private actions without a federal nexus.

- The Migratory Bird Treaty Act (MBTA) provides for the protection of migratory birds and prohibits their unlawful take or possession. The act bans "taking" any native birds; "taking" can mean killing a wild bird or possessing parts of a wild bird, including feathers, nests, or eggs. Exceptions are allowed for hunting game birds and for research purposes, both of which require permits.
- The Bald and Golden Eagle Protection Act (BGEPA) prohibits any form of possession or taking of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*). The act prohibits the "take" of bald and golden eagles; "taking" includes disturbing eagles, which means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

The AGFD manages and conserves wildlife in Arizona. Nearly all take of wildlife is regulated in some manner through the hunting and fishing license system. Arizona does not have a counterpart to the federal ESA, but a list of rare species (Wildlife Species of Concern [WSC]) was created in 1996, based on ESA candidate species, without creating any specific statutory protections for those species (AGFD 1996). However, hunting regulations are used to provide some protection. The WSC status is no longer a valid category because they were former but no longer candidate species under the ESA; however, the AGFD continues to track these species due to an existing memorandum of understanding between the USFWS and AGFD. Generally, no hunting or capture of those species is allowed, with some exceptions for managed recreational fisheries of native fish (AGFD 2017) and recreational capture of certain reptiles (AGFD 2015).

Arizona prepared a Comprehensive Wildlife Conservation Strategy in 2006 (AGFD 2006), later renamed the State Wildlife Action Plan (SWAP), through a state–federal partnership and grant program. The SWAP was updated in 2012 (AGFD 2012). The SWAP identifies Species of Greatest Conservation Need (SGCN) in several tiers. Tier 1A includes ESA-listed species and other rare species. Tier 1B includes species that are not listed but are regionally rare or declining, species with a U.S. range primarily in Arizona that are dependent on conservation efforts within the state, and other species with identified conservation issues that may warrant management action. Tier 1C includes species with substantial data gaps and unknown conservation status, but for which conservation concern may be warranted. Other tiers include species that are common, widespread, or in stable populations. Exhibit C addresses Tier 1A,1B, and 1C SGCNs. Species identified as WSC in 1996 are included as SGCNs in the SWAP and are addressed as SGCNs in Table C-l and the discussion in Exhibit C.

Native plants in Arizona are managed by the Arizona Department of Agriculture (ADA), which regulates harvest, salvage, and transport of plants. Harvest or salvage of most plant species may be permitted or required, and fees may be assessed on state land. Plants listed in the Highly Safeguarded category may only be taken or salvaged for scientific or conservation purposes. No Highly Safeguarded plant species, or any other rare plant species, are likely to be present in the Study Area.

The ADA administers the state noxious weed law under Arizona Administrative Code R3-4-245.

Inventory

An SWCA biologist surveyed the Project Area on May 25, 2021. The biologist documented existing conditions and noted any habitat features that may be important to special-status species or related to areas of biological wealth in the Project Area and vicinity. The larger Study Area outside of the Project Area was not surveyed.

On November 9, 2021, the USFWS IPaC database was queried to generate an unofficial list of ESA-listed species that have the potential to occur in the Study Area (USFWS 2021a) (Exhibit C-1). In addition, the AGFD Online Environmental Review Tool was queried on November 8, 2021, to generate a list of special-status species with records within 5 miles of the Project Area and a list of SGCN with modeled suitable habitat within 5 miles of the Project Area (AGFD 2021a) (Exhibit C-2).

Summary of Occurrence

The USFWS and AGFD identified several rare, endangered, threatened, and other special-status species that are known to occur or could occur in the region (i.e., within the Study Area for USFWS and within Project Area plus a 5-mile buffer for AGFD). These protected areas, special-status species, and their likelihood of being present in the vicinity of the proposed Project are addressed below in four sections: 1) Areas of Biological Wealth 2) Federally Listed Threatened and Endangered Species, 3) Other Special-Status Species, and 4) Protected Native Plants (AGFD 2021a; USFWS 2021a).

Areas of Biological Wealth

No designated or proposed critical habitat occurs within the Study Area (USFWS 2021a).

Several areas of biological wealth occur in the vicinity of the Project but outside of the Study Area, including Picacho Reservoir and the Gila River Riparian Movement Area wildlife corridor (AGFD 2013), 3.3 miles southeast and 4.25 miles north of the Project, respectively. The Central Arizona Project (CAP) canal, a barrier to wildlife movement, also occurs in the vicinity of the Project, approximately 1.3 miles east of the Study Area.

Pinal County Riparian Areas are mapped within the Study Area (AGFD 2021a; AGFD and Pinal County 2019). Within the online review tool GIS layer, riparian areas include hydroriparian, mesoriparian, and xeroriparian areas, but the online review tool does not indicate which type occurs within the mapped area. This riparian category was developed to provide planners and other project proponents the information to identify opportunities to protect riparian areas, open spaces, and other natural resources throughout Pinal County (AGFD and Pinal County 2019). No riparian areas were observed within the Project Area during field surveys (see Exhibit D). Xeroriparian areas occurred in the Study Area as stringers of vegetation within ephemeral drainages or along canals.

No Important Bird Areas (IBAs) occur within the Study Area or vicinity. The closest IBA, the Boyce Thompson Arboretum and Arnett-Queen Creeks IBA, is approximately 30 miles northeast of the Study Area (Audubon 2021).

Federally Listed Threatened and Endangered Species

Three species listed under the ESA and three candidate species were identified in the USFWS species list as occurring in the vicinity of the Study Area vicinity (USFWS 2021a): northern Mexican gartersnake (*Thamnophis eques megalops*), yellow-billed cuckoo (*Coccyzus americanus*), and Yuma Ridgway's (clapper) rail (*Rallus obsoletus*). The candidate species are Sonoran desert tortoise (*Gopherus morafkai*), roundtail chub (*Gila robusta*) and monarch butterfly (*Danaus plexippus*). The species' federal status and potential for occurrence in the vicinity of the Project are presented in Table C-1. While the jaguar (*Panthera onca*) is included as having modeled habitat within the Study Area (AGFD 2021a), no individuals have occurred in Pinal County since 1902 (Wildlife Conservation Society [WCS] 2021), and no suitable rugged, isolated habitat occurs for this species within the Study Area.

Table C-1. Evaluation of Federally Listed Species with Occurrences in the Vicinity of the Study Area

Common Name (Scientific Name)	Status[1]	Range or Habitat Requirements	Occurrence Status
Birds			
Yellow-billed cuckoo (*Coccyzus americanus*)	T	Typically found in riparian woodland vegetation (cottonwood [*Populus* sp.], willow [*Salix* sp.], or saltcedar [*Tamarix* sp.]) at elevations below 6,600 feet above mean sea level (amsl). Dense understory foliage appears to be an important factor in nest site selection. The highest concentrations in Arizona are along the Agua Fria, San Pedro, upper Santa Cruz, and Verde River drainages and Cienega and Sonoita Creeks.	Unlikely to occur. Suitable riparian habitat for this species is not present in the Project Area. The Study Area is unlikely to be used for breeding, migration, or dispersal due to the scarcity of riparian trees, native or nonnative, in the Study Area. This species has occurrence records within 5 miles of the Project (AGFD 2021a), but these records are mapped from Picacho Reservoir, 3.3 miles southeast of the Project. The existing and planned new evaporation ponds are unlikely to attract this species in the absence of suitable riparian trees. No yellow-billed cuckoos were observed at the two nearest eBird hotspots (Goree's Pond, within the Study Area approximately 1.5 miles south of the Project Area, and Goldman Dairy Sludge Ponds, 0.3 mile south of the Study Area), both associated with constructed industrial ponds (eBird 2021).
Yuma Ridgway's (clapper) rail (*Rallus obsoletus)*	E	Found in freshwater and brackish marshes below 4,500 feet amsl.	Unlikely to occur. There is no suitable marsh habitat for this species in or adjacent to the Study Area. Evaporation ponds lack vegetation, and the Study Area does not contain any marshes. This species has occurrence records within 5 miles of the Project (AGFD 2021a), but these records are mapped from Picacho Reservoir, 3.3 miles southeast of the Project. No Yuma Ridgway's (clapper) rails were observed at the two nearest eBird hotspots (Goree's Pond, within Study Area approximately 1.5 miles south of the Project Area, and Goldman Dairy Sludge Ponds, 0.3 mile south of the Study Area), both associated with constructed industrial ponds (eBird 2021).

Common Name (Scientific Name)	Status[1]	Range or Habitat Requirements	Occurrence Status
Reptiles			
Northern Mexican gartersnake (*Thamnophis eques megalops*)	T	Riparian obligate species found in lotic and lentic habitats that include cienegas and stock tanks (earthen impoundments) and rivers containing pools and backwaters. Most frequently found between 3,000 and 5,000 feet amsl but may occur up to approximately 8,500 feet amsl. This species uses adjacent terrestrial habitats for foraging, thermoregulation, gestation, shelter, immigration, emigration, and brumation. Found in areas of high native prey (fish and leopard frogs) concentration. Core population areas in Arizona include mid/upper Verde River drainage, mid/lower Tonto Creek, and the San Rafael Valley.	Unlikely to occur. There are no streams, rivers, springs, or livestock tanks suitable for this species in the Project Area. Because the concrete-lined canals lack native frog and fish species, northern Mexican gartersnakes are unlikely to hunt in the vicinity. In addition, there are no occurrence records for this species within 5 miles of the Project Area (AGFD 2021a). The Heritage Data Management System shows no occurrence records in Pinal County. The nearest designated critical habitat for this species is 65 miles northeast at Tonto Creek (USFWS 2021b).
Sonoran desert tortoise (*Gopherus morafkai*)	C	Occurs on primarily rocky, and often steep, hillsides and bajadas of Mohave and Sonoran desertscrub, typically at elevations below 7,800 feet amsl. May occur, but is less likely to occur, in desert grassland, juniper woodland, and interior chaparral habitats and even pine communities.	Unlikely to occur. There are no occurrence records within 5 miles of the Project Area (AGFD 2021a), and no suitable rocky or steep land features occur in the Project Area. Because the Study Area is surrounded by development and agriculture, this species would be unlikely to disperse through the Study Area.
Fish			
Roundtail chub (*Gila robusta*)	C	Species prefers cool to warm water in mid-elevation streams and rivers with pools up to 6.6 feet deep near flowing water. Cover consists of boulders, tree roots, deep water, and submerged vegetation. Elevational range of 1,210 to 7,220 feet amsl.	Unlikely to occur. There is no suitable aquatic habitat for this species in the Project Area. The Study Area is distant from known populations of this species. In addition, there are no occurrence records for this species within 5 miles of the Project Area (AGFD 2021a).
Insects			
Monarch butterfly (*Danaus plexippus*)	C	Habitat is complex. Generally, breeding areas are virtually all patches of milkweed (*Asclepias* sp.). The species occurs throughout Arizona during the summer and migrates to winter in Mexico and California, though small numbers do overwinter in the low deserts of southwestern Arizona.	May occur. This species may be present as transients during migration or as occasional individuals passing through the Study Area enroute to larval food plants or nectar resources. No *Asclepias* species were observed within the Project Area for larval use, but nectar sources are available for foraging and migration.

Note: Table lists the species named in USFWS official species list (USFWS 2021a) and in the Arizona Online Environmental Review Tool (AGFD 2021a).

[1]Status abbreviations: E = Endangered. T = Threatened. C = Candidate.

Other Special-Status Species

Other special-status species include the following:

- Eagles protected by the BGEPA.
- Birds of Conservation Concern (BCC), which are bird species, beyond those designated as federally threatened or endangered, that represent the USFWS's highest conservation priorities.

The relevant BCC for this analysis are those identified by the USFWS (2021c) as occurring in Bird Conservation Region (BCR) 33.

- SGCN in Arizona, which are species identified by the AGFD as warranting heightened attention because of low and declining populations. SGCN are prioritized into tiers. Tier 1A species are those for which the AGFD has entered into an agreement or has legal or other contractual obligations or warrants the protection of a closed season. This tier includes all federally threatened and endangered species. Tier 1B represents the remainder of the species meeting the AGFD's vulnerability criteria. Tier 1C species are those for which existing data were insufficient to score one or more vulnerability criteria.

The species in these categories (other than those also designated as federally threatened or endangered, which are addressed above) have occurrence records or predicted habitat modeled within 5 miles of the Project Area (AGFD 2021a) and are discussed and listed below in Table C-2, where they are evaluated for potential occurrence based on the results of Project Area surveys, familiarity with the vicinity, and freely available information sources, including the AGFD's Heritage Data Management System (AGFD 2021b); the online field guide *Reptiles and Amphibians of Arizona* (Brennan 2021); the *Breeding Bird Atlas* (Corman and Wise-Gervais 2005); the online field guide *All About Birds* (Cornell Lab of Ornithology 2021); eBird (2021); Google Earth (2021); and the Arizona Ecological Services website and document library (USFWS 2021d).

BALD AND GOLDEN EAGLES

The Study Area is within the year-round range for the golden eagle and the non-breeding/limited breeding range for the bald eagle. Bald and golden eagles favor nest sites in tall trees, mountain cliffs, or human-made structures (e.g., observation or transmission towers) that are distant from human disturbance (Cornell Lab of Ornithology 2021). The Study Area and vicinity include mostly agricultural land with isolated areas of open desert and residential communities, local and state roads, and a UPRR freight line within the Study Area. The Study Area and vicinity provide no nesting habitat for bald eagle, and it is unlikely that the bald eagle would utilize these areas for foraging or other activities (see Table C-2). Impacts to the bald eagle would be unlikely to occur. No suitable golden eagle nesting sites (e.g., cliffs) are present in or near the Study Area, and no impact to individuals or nests would occur. Individuals could fly over the Study Area while foraging. However, because the area of impact is localized and represents an extremely small portion of an individual eagle's territory, impacts to a foraging individual from Project activities would be unlikely to occur. These eagle species were not documented by SWCA during Project-specific surveys in May 2021.

Table C-2. Other Special-Status Species that May Occur or are Known to Occur in the Vicinity of the Study Area

Common Name (Scientific Name)	Habitat and Notes	Status*		Occurrence Status
		Federal	State	
Amphibians				
Sonoran Desert toad (*Incilius alvarius*)	Occurs in desert, cropland, grassland, shrubland, woodland, and suburban areas. Can occur near permanent or temporary water and can be found relatively far from water.	--	SGCN (1B)	May occur. Portions of the Study Area include suitable habitat.
Birds				
Abert's towhee (*Melozone aberti*)	Common in riparian woodlands or mesquite (*Prosopis* sp.) bosques near water and in agricultural settings.	MBTA	SGCN (1B)	May occur. Mesquite trees and agricultural land are within the Study Area.
American bittern (*Botaurus lentiginosus*)	Occurs in marshlands and very wet meadows. Also found along rivers, lakes, and ponds with developed wetland habitat.	MBTA	SGCN (1B)	Unlikely to occur. No habitat present in Study Area or vicinity.
Arizona Bell's vireo (*Vireo bellii arizonae*)	A summer resident to Arizona that resides near riparian habitat of willow and mesquite trees.	MBTA	SGCN (1B)	Unlikely to occur. No habitat present in Study Area or vicinity.
Bald eagle (*Haliaeetus leucocephalus*)	Prefers large bodies of water with fish for prey. Nesting sites in the Sonoran Desert are primarily in large trees in riparian areas.	MBTA BGEPA	SGCN (1A)	Unlikely to occur. No habitat present in Study Area or vicinity.
Bendire's thrasher (*Toxostoma bendirei*)	Occurs in desert grasslands, shrublands, and agricultural areas.	MBTA BCC	--	May occur. Suitable habitat present.
Black-chinned sparrow (*Spizella atrogularis*)	Dry brushlands, typically breed on rocky hillsides and winter downslope in desertscrub.	MBTA BCC	--	May occur. Suitable habitat present.
Brewer's sparrow (*Spizella breweri*)	Wintering habitat in the Desert Southwest and Mexico.	MBTA	SGCN (1C)	May occur. Overwinters in the vicinity.
Brown-crested flycatcher (*Myiarchus tyrannulus)*	Found in open woodland, shrubby habitat, or riparian areas.	MBTA	SGCN (1C)	Unlikely to occur. No woodland or riparian habitat present in Study Area or vicinity.
Costa's hummingbird (*Calypte costae*)	Found is Sonoran and Mojave desertscrub near washes of native desert vegetation or rocky slopes of saguaro (*Carnegiea gigantea*) and creosote bush (*Larrea tridentata*) lowlands.	MBTA BCC	SGCN (1C)	May occur. Suitable habitat present.
Curve-billed thrasher** (Palmer's) (*Toxostoma curvirostre palmeri*)	Favors open country with creosote bush, saguaro, paloverde (*Parkinsonia* sp.), and cholla (*Cylindropuntia* sp.).	MBTA BCC	--	Known to occur. Suitable habitat present. This species was observed in the Project Area during May 2021 surveys.
Eastern meadowlark (*Sturnella magna)*	Found in grasslands, pastures, hayfields, old or abandoned fields, and native prairies and savannahs. Primarily a winter species in central Arizona but can be found year-round.	MBTA BCC†	SGCN (1C)	May occur. Suitable habitat present.
Elf owl (*Micrathene whitneyi*)	Occurs in wooded canyons in Sonoran desertscrub with saguaros.	MBTA	SGCN (1C)	Unlikely to occur. No wooded canyons occur in the Study Area.

Common Name (Scientific Name)	Habitat and Notes	Status*		Occurrence Status
		Federal	State	
Ferruginous hawk (*Buteo regalis)*	Found in open scrublands and woodlands, grasslands, and semidesert grasslands.	MBTA BCC†	SGCN (1B)	Unlikely to occur. Suitable habitat does not occur.
Gila woodpecker (*Melanerpes uropygialis*)	Found in Sonoran desertscrub with saguaros present, or riparian woodlands with mature trees.	MBTA BCC	SGCN (1B)	May occur. Saguaros or suitable mature trees may occur within Study Area but outside of the Project Area.
Gilded flicker (*Colaptes chrysoides*)	Occurs in Sonoran desertscrub with saguaros present, or riparian woodlands with mature trees.	MBTA BCC	SGCN (1B)	May occur. Saguaros or suitable mature trees may occur within Study Area but outside of the Project Area.
Lawrence's goldfinch (*Spinus lawrencei*)	In Arizona, winters in desert arroyos, floodplains, mesquite bosques, weedy fields, cultivated fields, or roadsides.	MBTA BCC	--	May occur in the winter.
LeConte's thrasher (*Toxostoma lecontei*)	Occurs in Sonoran desertscrub dominated by creosote bush, with scattered trees used for nesting.	MBTA BCC	SGCN (1B)	Unlikely to occur. The Study Area is outside the known species' range, and there are no records within 5 miles of the Project Area.
Lincoln's sparrow (*Melospiza lincolnii*)	Winters in central Arizona; prefers dense, brushy areas, often near water.	MBTA	SGCN (1B)	May occur. Overwinters in the vicinity.
Lucy's warbler (*Oreothlypis luciae*)	Found in mesquite bosques and xeroriparian washes.	MBTA BCC	SGCN (1C)	May occur. Suitable habitat may occur within the Study Area outside of the Project Area.
Marsh wren (*Cistothorus palustris)*	Occurs in marshes or wetlands with cattails (*Typha* sp.), bulrushes *(Family Cyperaceae)*, and cordgrass (*Spartina* sp.) present.	MBTA BCC†	SGCN (1C)	Not likely to occur. No habitat present in Study Area or vicinity.
Pacific wren (*Troglodytes pacificus)*	Found in coniferous forests, especially those of spruce (*Picea* sp.) and fir (*Abies* sp.).	MBTA	SGCN (1B)	Unlikely to occur. There are no coniferous forests or rivers and streams in or near the vicinity of the Study Area.
Pyrrhuloxia (*Cardinalis sinuatus*)	Found in upland deserts, riparian woodlands, desert scrublands, farm fields, and residential areas.	MBTA BCC	--	May occur. Suitable habitat occurs in the Study Area.
Red-naped sapsucker (*Sphyrapicus nuchalis*)	Wintering habitat includes pine oak woodlands, deciduous trees, and orchards.	MBTA	SGCN (1C)	Unlikely to occur. There are no woodlands, deciduous trees, or orchards in or near the Study Area
Sage thrasher (*Oreoscoptes montanus)*	A winter species in Central Arizona that favors grasslands to open desert.	MBTA BCC†	SGCN (1C)	May occur; species overwinters in the vicinity.
Savannah sparrow (*Passerculus sandwichensis)*	Found in open grasslands, meadows, pastures, grassy roadsides and cultivated fields planted with cover crops.	MBTA	SGCN (1B)	May occur. Suitable habitat occurs in the Study Area, and the species overwinters in the vicinity.
Verdin (southwest) (*Auriparus flaviceps acaciarum*)	Occurs in arid habitats in the Desert Southwest as a year-round resident. Often occurs along washes. The southwest subspecies is associated with the Sonoran Desert from southern California to Mexico.	MBTA BCC	--	May occur. Suitable habitat occurs in the Study Area.

Common Name (Scientific Name)	Habitat and Notes	Status*		Occurrence Status
		Federal	State	
Waterfowl and occasional-use birds	Waterfowl and other birds may use the existing and planned new evaporation ponds within the Project Area as loafing ponds—midday stops where birds rest before feeding or heading back to the roost. Other birds may be attracted to the water in the evaporation ponds but not use the area for nesting, roosting, foraging, or reproduction.	MBTA		May occur. Waterfowl and other birds have been found to occur at eBird industrial pond habitats within the Study Area (Goree's Pond) and in the vicinity of the Study Area (Goldman Dairy Sludge Ponds, 0.3 mile south of the Study Area) (eBird 2021).
Western burrowing owl** (*Athene cunicularia hypugaea*)	Open areas with low brush cover, including grasslands, agricultural margins, and desertscrub. Year-round resident or migratory.	MBTA BCC	SGCN (1B)	Known to occur. This species was observed within the Project Area during May 2021 survey, and suitable habitat (e.g., concrete canals) occurs within the Project Area.
Wood duck (*Aix sponsa*)	Prefers streams and ponds with trees and other dense vegetation.	MBTA	SGCN (1B)	Unlikely to occur. No freshwater habitats are present in the Study Area.
Yellow warbler (*Setophaga petechia* ssp. *sonorana*)	Migrates through central Arizona utilizing riparian areas and landscaping, often near water.	MBTA BCC	SGCN (1B)	May occur. The species may pass through the Study Area and vicinity during migration.
Fish				
Desert sucker (*Catostomus clarkii*)	In Arizona, occurs throughout the Gila River basin, and in the Bill Williams tributaries. Prefers rapids and flowing pools of streams and rivers.	--	SGCN (1B)	Unlikely to occur. The Study Area does not contain suitable habitat. Records for this species occur within 5 miles of the Project Area (AGFD 2021a), likely from the Gila River.
Reptiles				
Desert mud turtle (*Kinosternon sonorense sonorense*)	Inhabits rivers, streams, or aquatic impoundments in desertscrub, semi-desert grasslands, or oak/pine-oak woodlands.	--	SGCN (1B)	Unlikely to occur. The Study Area does not contain suitable habitat for the species.
Gila monster (*Heloderma suspectum*), includes Banded Gila monster (*Heloderma suspectum cinctum*)	Occurs in Sonoran desertscrub, typically absent from disturbed and developed areas.	--	SGCN (1A)	Unlikely to occur. The Study Area is isolated from other desert areas by development. There are no records of the species within 5 miles of the Project Area (AGFD 2021a).
Goode's horned lizard (*Phrynosoma goodei*)	Occurs in valley bottoms and bajadas in Sonoran desertscrub.	--	SGCN (1B)	Unlikely to occur. The Study Area is on the eastern periphery of the species range and does not contain suitable habitat for the species.
Regal horned lizard (*Phrynosoma solare*)	Found in valley bottoms in Sonoran desertscrub and desert grasslands; avoids the lowest elevations.	--	SGCN (1B)	May occur. Portions of the Study Area 2-mile buffer may include suitable habitat.

Common Name (Scientific Name)	Habitat and Notes	Status*		Occurrence Status
		Federal	State	
Resplendent shovel-nosed snake (*Chionactis annulata*)	Found in intermontane valleys and lower bajadas in Sonoran desertscrub. Prefers sandy washes and loose soil.	--	SGCN (1C)	May occur. Portions of the Study Area 2-mile buffer may include suitable habitat.
Sonoran coralsnake (*Micruroides euryxanthus*)	Common in rocky terrain with drainages, vegetated washes, and canyons.	--	SGCN (1B)	Unlikely to occur. Suitable habitat is not present in or near the Study Area.
Tiger rattlesnake (*Crotalus tigris*)	Occurs in rocky slopes in Sonoran desertscrub.	--	SGCN (1B)	Unlikely to occur. The Study Area does not contain rocky slopes.
Variable sandsnake (*Chilomeniscus stramineus*)	Occurs in sandy valleys in Sonoran desertscrub.	--	SGCN (1B)	May occur. Portions of the Study Area outside of the Project Area contain suitable habitat.
Mammals				
Antelope jackrabbit (*Lepus alleni*)	Occurs in arid grasslands with scattered shrubs and deserts, foothills, mesas, and bajadas.	--	SGCN (1B)	May occur. The Study Area and surrounding vicinity is open and contains creosote bush. There are occurrence records for this species within 5 miles of the Project Area (AGFD 2021a).
Arizona myotis (*Myotis occultus)*	Found in ponderosa pine and oak-pine woodlands near water, and along the lower Colorado and Verde Rivers.	--	SGCN (1B)	Unlikely to occur. There are no woodlands or riparian features in the Study Area.
Brazilian free-tailed bat (*Tadarida brasiliensis*)	A migratory species that may spend the entire year in southern Arizona. Roosts in caves, tunnels, and buildings. Forages widely, often over farmlands.	--	SGCN (1B)	May occur. Suitable building roosting habitat has the potential to occur within the Study Area outside of the Project Area, and the species could utilize the Study Area for foraging.
Cave myotis (*Myotis velifer*)	Occurs in desertscrub containing creosote bush, paloverde, and cacti. A migratory species that roosts in caves, mines, and bridges. Forages in desertscrub, often near water.	--	SGCN (1B)	May occur. Suitable bridge roosting habitat has the potential to occur in the Study Area outside of the Project Area, and the species could utilize the Study Area for foraging.
Greater Western bonneted bat (*Eumops perotis californicus*)	Favors desert habitat near cliffs where the species uses rock crevices for roosting. Forages widely for insects.	--	SGCN (1B)	May occur. No roosting habitat is present, but the species could utilize the Study Area for foraging.
Harris' antelope squirrel (*Ammospermophilus harisii*)	Found in creosote bush-bursage (*Ambrosia* sp.) or saltbush-creosote bush deserts, usually in areas with rocky soil and slopes.	--	SGCN (1B)	Unlikely to occur. No rocky slopes are present in the Study Area.

Common Name (Scientific Name)	Habitat and Notes	Status*		Occurrence Status
		Federal	State	
Kit fox (*Vulpes macrotis*)	Prefers open, flat desert, with soft or sandy soils for ease to excavate burrows.	--	SGCN (1B)	May occur. The Study Area is within the species predicted range. Soft soils are present in the Study Area.
Lesser long-nosed bat (*Leptonycteris yerbabuenae*)	Occurs in Sonoran desertscrub, grasslands, and forests with saguaros and agaves. Roosts in caves, abandoned mines, and unoccupied buildings near foraging resources.	--	SGCN (1A)	May occur. No roosting habitat occurs in the Project Area; however, saguaros may occur within the Study Area outside of the Project Area.
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	Roosts in rock crevices in high cliffs and occasionally in buildings. Forages near any water source from lakes, rivers, irrigation canals, and cattle water tanks.	--	SGCN (1B)	May occur. Suitable building habitat has the potential to occur in the Study Area outside of the Project Area, and the species could utilize the Study Area for foraging.
Spotted bat (*Euderma maculatum*)	Roosts in high cliffs and canyons, prefer to forage high above water and is common in lower desert valleys.	--	SGCN (1B)	Unlikely to occur. No roosting or foraging habitat is present in the Study Area.
Pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*)	Found in desertscrub up to coniferous forests. Roosts in caves, mines, lava tubes and occasionally abandoned buildings.	--	SGCN (1B)	May occur. Suitable abandoned building roosting habitat has the potential to occur within the Study Area outside of the Project Area, and the species could utilize the Study Area for foraging.
Western red bat (*Lasiurus blossevillii*)	Found in riparian and wooded areas. Roosts in trees, particularly cottonwoods. May roost in saguaro cavities.	--	SGCN (1B)	May occur. The species could utilize the Study Area for foraging. Trees suitable for roosting or saguaros may occur within the Study Area outside of the Project Area.
Western yellow bat (*Lasiurus xanthinus*)	Associated with palm trees and riparian tree species in urban and riparian locations; likely a year-round resident in Arizona.	--	SGCN (1B)	May occur. The species could utilize the Project Area and vicinity for foraging. Palms trees or riparian trees suitable for roosting may occur in the Study Area outside of the Project Area.

Common Name (Scientific Name)	Habitat and Notes	Status*		Occurrence Status
		Federal	State	
Yuma myotis (*Myotis yumanensis*)	Occurs in a wide variety of habitats, including riparian, desertscrub, woodlands and forests. Roosts in buildings, cliffs, cave, and mines. Forages over or near water.	--	SGCN (1B)	May occur. Suitable building roosting habitat has the potential to occur within the Study Area outside of the Project Area, and the species could utilize the Study Area for foraging.

Source: Range or habitat information is from AGFD (2021a; 2021b); Brennan (2021); Corman and Wise-Gervais (2005); Cornell Lab of Ornithology (2021); eBird (2021); USFWS (2021a; 2021b).

Note: Notes regarding documented occurrence, other than observations made during SWCA's Project-specific surveys, are from AGFD (2021a, 2021b).

* Federal Status Definitions

BCC = Bird of Conservation Concern.

BCC† = Bird of Conservation Concern for regions other than BCR 33. Included in table because they are also Arizona SGCN.

BCR = Bird Conservation Region.

BGEPA = Bald and Golden Eagle Protection Act

CCA = Candidate Conservation Agreement

MBTA = Migratory Bird Treaty Act

State Status Definitions

SGCN = Species of Greatest Conservation Need; species identified by AGFD (2012) as having conservation priority. Tier 1B species are those categorized as "vulnerable" but not fitting the Tier 1A criteria for highest priority. Tier 1C species are those for which existing data were insufficient to score one or more vulnerability criteria.

**Species that were observed in the Project Area during the May 2021 field survey

BIRDS OF CONSERVATION CONCERN

The Study Area is within BCR 33 (USFWS 2021d), for which 27 BCC species are listed. Of these, 12 species may occur or are known to occur in the Study Area or vicinity (see Table C-2): Bendire's thrasher (*Toxostoma bendirei*), black-chinned sparrow (*Spizella atrogularis*), Costa's hummingbird (*Calypte costae*), Palmer's curve-billed thrasher (*Toxostoma curvirostre palmeri*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), Lawrence's goldfinch (*Spinus lawrencei*), Lucy's warbler (*Oreothlypis luciae*), pyrrhuloxia (*Cardinalis sinuatus*), verdin (southwest) (*Auriparus flaviceps acaciarum*), western burrowing owl (*Athene cunicularia hypugaea*), and yellow warbler (*Setophaga petechia* ssp. *sonorana*). Birds that are BCC for regions other than BCR 33 but that are classified as SGCN in Arizona will be considered in the following section. A western burrowing owl and a curve-billed thrasher were observed in the Project Area during the May 2021 survey. Waterfowl and other birds may use the existing and planned new evaporation ponds within the Project Area as loafing ponds, which are midday stops where birds rest before feeding or heading back to the roost. Other birds may be attracted to the water in the evaporation ponds but not use the area for nesting, roosting, foraging, or reproduction.

SPECIES OF GREATEST CONSERVATION NEED

Twenty-one species categorized as SGCN 1A or 1B may occur within 5 miles of the proposed Project Area (see Table C-2). Eleven mammals may occur: antelope jackrabbit (*Lepus alleni*), Brazilian free-tailed bat (*Tadarida brasiliensis*), cave myotis (*Myotis velifer*), greater western bonneted bat (*Eumops perotis californicus*), kit fox (*Vulpes macrotis*), lesser long-nosed bat (*Leptonycteris yerbabuenae*), pocketed free-tailed bat (*Nyctinomops femorosaccus*), pale Townsend's big-eared bat (*Corynorhinus townsendii pallescens*), western red bat (*Lasiurus blossevillii*), western yellow bat (*Lasiurus xanthinus*), and Yuma myotis (*Myotis yumanensis*). Seven birds may occur or are known to occur: Abert's towhee (*Melozone aberti*), Gila woodpecker, gilded flicker, Lincoln's sparrow (*Melospiza lincolnii*), Savannah sparrow (*Passerculus sandwichensis*), western burrowing owl, and yellow warbler. The western burrowing owl was the only of these species to be observed in the Project Area. Two reptile species may occur: regal horned lizard (*Phrynosoma solare*) and variable sandsnake (*Chilomeniscus stramineus*). One amphibian species may occur: the Sonoran Desert toad (*Incilius alvarius*). No fish species are likely to occur.

Six species listed as SGCN 1C may occur within 5 miles of the Project Area (see Table C-2), including five birds and one reptile: Brewer's sparrow (*Spizella breweri*), Costa's hummingbird, eastern meadowlark (*Sturnella magna*), Lucy's warbler, sage thrasher (*Oreoscoptes montanus*), and resplendent shovel-nosed snake (*Chionactis annulata*).

Waterfowl and other birds may use the existing and planned new evaporation ponds within the Project Area as loafing ponds (midday stops where birds rest before feeding or heading back to the roost). Other birds may be attracted to the water in the evaporation ponds but not use the area for nesting, roosting, foraging, or reproduction.

Protected Native Plants

The Arizona Native Plant Law (A.R.S. § 3-904) (ANPL) identifies a lengthy list of plant species—largely cacti, agaves, yuccas, and desert trees—that are susceptible to removal for collection, landscaping, sale, or other commercial uses. The ANPL states that these plants shall not be taken, transported, or possessed from any land without permission and a permit from the ADA; it also requires notification prior to land clearing even if the plants will be destroyed. Protected native plants occur within the Project Area. Velvet mesquite (*Prosopis velutina*), a harvest restricted and salvage assessed protected native plant, was identified in Project Area during the May 2021 survey. Additional native trees, cacti, and succulents have the potential to occur in the Study Area.

NOXIOUS WEEDS

The State of Arizona maintains a list of noxious weeds in three categories: Class A, Class B, and Class C (ADA 2021). Class A species are those that are not known to occur in Arizona, are of limited distribution, and are of high priority for quarantine, control, or mitigation. Class B noxious weeds are species known to occur but are of limited distribution in Arizona and may be high-priority pests for quarantine, control, or mitigation if a significant threat to crop, commodity, or habitat exists. Class C noxious weeds are species of plants that are widespread but may be recommended for active control based on risk assessment.

Noxious weeds are known to occur in the vicinity of the project (iMap Invasives 2021). Noxious weeds were observed within the Project Area during the May 2021 field survey: Class B species, including stinknet (*Oncosiphon piluliferum*) and Saharan mustard (*Brassica tournefortii*), and Class C species, including saltcedar (*Tamarix ramosissima*). Measures will be taken to avoid spreading noxious weeds in the Study Area.

Summary of Potential Effects

Areas of Biological Wealth

The Study Area does not overlap with any areas of biological wealth. Because of the distance to the wildlife corridors and Pinal County riparian areas, the Project is expected to have no impact on the riparian area or the wildlife or plants that occur there. Because the Project Area is already largely disturbed and is surrounded by agricultural, commercial, and residential disturbance, construction and operation of the

Project is unlikely to increase the fragmentation in the vicinity or to create a significant additional barrier to wildlife movement. No IBAs and proposed or designated critical habitat occurs within the Study Area.

Pinal County Riparian Areas intersect the Study Area but would not be expected to be disturbed as a result of Project activities. As noted above, field surveys showed that no riparian areas occurred within the Project Area and riparian vegetation outside the Project Area was limited to xeroriparian vegetation along ephemeral drainages or canals. The Project is not expected to negatively impact Pinal County Riparian Areas occurring in the Study Area.

Federally Listed Threatened and Endangered Species

No suitable habitat occurs within the Study Area for the following species that are listed under the ESA or are candidates for listing—yellow-billed cuckoo, Yuma Ridgway's (clapper) rail, northern Mexican gartersnake, Sonoran desert tortoise, or roundtail chub—and these species would be unlikely to occur. Therefore, the Project would be unlikely to impact these species.

Habitat may be suitable for use by monarch butterfly. Monarch butterfly habitat comprises milkweed, which is used exclusively for reproduction, and floral nectar resources for adult food sources. No milkweed was observed in the Project Area; however, monarch butterflies may use flowering plants in the Study Area for foraging. As such, impacts to this species would be minor. A very small portion of suitable dispersal or foraging habitat would be lost, relative to the total amount of habitat in the vicinity. Individual monarch butterflies may experience injury, change of behavior, and loss of foraging habitat as a result of the Project. Individual monarch butterflies would be expected to largely shift activity to nearby suitable habitat.

Other Special-Status Species

The following sections refer to special-status species that are not federally listed or candidates for federal listing.

SPECIAL-STATUS MAMMAL SPECIES

The Project Area is unlikely to support suitable roosting habitat for most bat species, though within the 2-mile buffer (Study Area) the potential does occur for palm trees (Family Arecaceae) or other large riparian trees that the western red bat or western yellow bat may use for roosting, as well as buildings (abandoned or otherwise) that Brazilian free-tailed bat, lesser long-nosed bat, pocketed free-tailed bat, pale Townsend's big-eared bat, and Yuma myotis may use for roosting. However, no palm trees, large riparian trees, or suitable building structures occur in the Project Area, and therefore, no bat roosts would be expected to be removed or destroyed as a result of the Project. Bats using trees or buildings as day roosts have the potential to be negatively impacted by noise impacts, leading to behavior changes or loss of fitness for individuals. Impacts would be minor as trees used for day roosts would be widespread outside the Study Area.

Project activities would remove vegetation and agricultural irrigation, which may decrease the suitability of the area for foraging by insectivorous bat species. Any lesser-long nosed bats that occur would likely be unaffected by the project. Because they are nocturnal and nectivorous, and no roosts or potential food plants (e.g., agaves [*Agave* spp.] or saguaro [*Carnegiea gigantea*]) occur within the Project Area, no impacts would be expected to any lesser-long nosed bats that occur in the Study Area.

Bat species can collide with human-made structures during long-distance migration. Migrating bats often fly high above ground level and do not actively echolocate. However, during normal foraging activity, bats actively use echolocation and are typically able to detect and avoid features such as overhead transmission lines (Arnett et al. 2015). No information suggests that transmission lines in a setting such as the Study Area would pose a risk to bats. Project activities at night would increase light pollution and human presence in the Study Area and would impact bat activity patterns. The increase of nighttime lighting in the Project Area has the potential to attract insects, which could have minor beneficial impacts to some bat species as their food source increased. However, some bat species would likely shift their foraging activities away from construction and additional light. However, these negative impacts would likely be minor because foraging habitat for insectivorous species occurs outside of the Study Area.

Project construction activities could cause death or injury to antelope jackrabbit or kit fox, particularly individuals that may be sheltering within underground burrows instead of fleeing. Project construction could cause behavior changes, as individuals would be expected to flee from an increase of noise, vibration, and human presence within the Project vicinity. These behavior changes could increase depredation, decrease foraging success, reduce reproductive success, and result in loss of fitness for that individual from increased metabolic output. Project construction activities would be temporary. The loss and degradation of mammal habitat from short-and long-term project activities would be negligible as the Project Area is relatively small, contains little native vegetation, and is entirely disturbed. Similarly, because the Study Area is largely disturbed by agriculture, infrastructure, and development, any loss of vegetation from construction activities would not contribute meaningfully to habitat fragmentation for special-status mammals or decrease connectivity between habitat patches.

Construction and operation of the Project would result in an increase of emissions including fugitive dust, VOCs, CO, oxides of nitrogen, particulate matter, SO_2, and CO_2 (see Exhibit B for details). The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals.

Impacts to special-status mammals would not be expected to arise from water quality within the existing or new evaporation ponds, as these areas are fenced and mammals would not be expected to use these ponds.

SPECIAL-STATUS BIRD SPECIES

Because bald and golden eagle habitat does not occur, these species are unlikely to occur. Therefore, no impacts to either of these species resulting from the Project would be expected.

Six bird species (See Table C-2) only occur in the vicinity of the Project for wintering or migration and therefore the Project will have no potential for nesting impacts.

Potential impacts to special-status bird species could include changes in behavior due to Project-related noise, vibration, and the presence of workers and equipment; loss of breeding and foraging habitat; and impacts to nesting species. Potential impacts to nesting birds and their eggs covered under the MBTA, including burrow nests of the western burrowing owl, would be avoided and/or minimized either by limiting ground-clearing/vegetation removal activities to outside the breeding season (generally March–September with raptors breeding generally January–June) or through surveys to identify active nests and placement of buffers around those active nests until the young fledge or the nest fails.

Transmission lines can pose a collision risk to birds (Avian Power Line Interaction Committee [APLIC] 2012). However, many factors influence whether birds are likely to collide with a specific transmission line. Collision risk is relatively low when multiple transmission lines are co-located or placed near other infrastructure (APLIC 2012). The Project would be constructed in an area with numerous existing transmission lines and would be unlikely to contribute to an increase in bird mortality within the Study

Area. To minimize that risk, the Applicant will construct the proposed transmission line following the guidelines outlined in the current version of the APLIC *Suggested Practices for Avian Protection on Powerlines* and *Reducing Avian Collisions with Power Lines* manuals. Electrical transmission and distribution lines can also cause bird electrocution, although the risk is highest with lower voltage lines. Electrocution occurs when a bird simultaneously contacts energized and grounded electrical components. High-voltage lines require spacing between those components that cannot be spanned even by very large birds so that electrocution risk is precluded almost entirely (APLIC 2006).

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Because bird species can easily circumvent fencing and may use the evaporation ponds for loafing or resting, negative impacts could occur to special-status bird species from water pollutants. However, these impacts would likely be extremely minor as monitoring of the existing evaporation ponds has resulted in no observed negative impacts to wildlife, with no bird deaths. SRP will continue monitoring the existing ponds, will monitor the proposed new ponds, and will take appropriate actions to remain in compliance with the MBTA.

SPECIAL-STATUS REPTILE SPECIES

Potential Project-related impacts on special-status reptile species would include changes in behavior due to the presence of workers and equipment, including moving away from sources of noise and vibration; the potential for individuals being crushed or buried during ground-disturbing activities; and the loss of habitat.

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Impacts to special-status reptiles, which in this case only includes the Sonoran desert tortoise, would not be expected to arise from water quality within the existing or new evaporation ponds, as these areas are fenced and tortoises would not be expected to use these ponds.

SPECIAL-STATUS AMPHIBIAN SPECIES

Potential impacts to Sonoran Desert toad include death, injury, or impacts arising from behavior changes and would be similar to those described for terrestrial mammals. Potential impacts from the loss, degradation, and fragmentation of amphibian habitat from Project activities would be the same as those described for terrestrial mammals.

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Amphibians attracted to the evaporation ponds (existing and new) at the Project may experience death or reduced health from any pollutants that may occur there. However, because these ponds are small and localized, impacts would not rise to population-level impacts.

SPECIAL-STATUS FISH SPECIES

The Project would have no impact on special-status fish species because no habitat for special-status fish species is present in the Project Area. Project activities would not impact perennial water outside of the Study Area, including Picacho Reservoir, the CAP canal, or the Gila River. The only perennial water in the project vicinity is the Picacho Reservoir located approximately 3.3 miles southeast of the Project Area. Project activities would not impact the reservoir.

Any fish that occur in the concrete-lined canals would originate from the CAP canal and the Florence-Casa Grande Canal (both of which run approximately north–south outside of the Study Area and may supply water to the concrete canals located in the Project or Study Areas), where fish are known to occur (Kesner and Marsh 2010). However, the fish caught in these canals were invasive species or sport fish that had been stocked or released into waterways. No native, special-status species were known to occur in these canals (Kesner and Marsh 2010). No impacts from increased emissions or from water quality in the evaporative ponds would be expected to occur to special-status fish species as none occur in the Study Area.

Protected Native Plants

Depending on Project activities, plant species protected under the ANPL could be removed during vegetation-clearing activities. Because the relatively small Project Area is largely previously disturbed by the existing Coolidge generating station, agriculture, and development, the loss of vegetation in the Project Area will result in minor impacts to protected native plants. In addition, impacts to special-status plant species from increased air emissions would be minor. The likelihood and severity of impacts from air emissions would decrease with increasing distance from the Project Area.

NOXIOUS WEEDS

Measures will be taken to avoid introducing or spreading noxious weeds in the Project Area, and therefore, the Project would be unlikely to contribute to an increase of noxious weeds, in extent or abundance, in the vicinity of the Project.

Mitigation

The following mitigation measures would reduce the potential for impacts to special-status species as a result of the Project:

- To minimize risk to migratory birds, the powerlines would be constructed following industry-suggested practices aimed at reducing avian collisions and electrocutions (APLIC 2012, 2006). If avian-line interactions become a problem, SRP would move quickly to evaluate the issue and craft a solution using appropriate measures.
- If vegetation-disturbing activities are planned during the migratory bird nesting season (March–September or January–June for raptors), measures to avoid any active bird nests within the Project Area at that time would be taken to maintain compliance with the MBTA since suitable nesting habitat for migratory bird species is present in the Project Area.
- Preconstruction surveys for western burrowing owls and other migratory birds by qualified biologists following current protocol are recommended. During AGFD review of the Project, the agency recommended occupancy surveys be conducted (Exhibit C-3). Occupied burrows are to be avoided, where feasible. If necessary, burrowing owl translocation would be conducted by experienced personnel holding the appropriate state and federal permits.
- If native plants listed under the ANPL are present in the Project Area, the ADA Notice of Intent to Clear Land would be submitted prior to ground clearing. The submittal time frame depends on the acreage of the area to be cleared.
- To reduce or eliminate the potential to introduce or spread noxious or invasive plants, equipment would be cleaned prior to and following mobilizing to the Project Area.

Conclusion

The proposed Project is not likely to significantly affect any rare, endangered, or special-status species. No ESA-listed species are present, and none would be affected by the proposed Project. No protected areas, or any areas of biological wealth, are within the Study Area. The risk that electrical infrastructure poses to birds would be addressed by following industry suggested practices as design features for the Project, and preconstruction surveys for the western burrowing owl would address potential impacts to that species.

References

Arizona Department of Agriculture (ADA). 2021. Noxious Weed List, revised January 2020. Available at: https://agriculture.az.gov/pestspest-control/agriculture-pests/noxious-weeds. Accessed September 2021.

Arizona Game and Fish Department (AGFD). 1996. Wildlife of Special Concern in Arizona. Public review draft. Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix, Arizona. 23 p.

______. 2006. Arizona's Comprehensive Wildlife Conservation Strategy: 2005-2015. Available at: https://repository.asu.edu/attachments/78349/content/CWCS_Final_May2006.pdf. Accessed September 2021.

______. 2012. Arizona's State Wildlife Action Plan: 2012–2022. Phoenix, Arizona. Available at: https://s3.amazonaws.com/azgfd-portal-wordpress/PortalImages/files/wildlife/2012-2022_Arizona_State_Wildlife_Action_Plan.pdf. Accessed September 2021.

______. 2013. The Pinal County Wildlife Connectivity Assessment: Report on Stakeholder Input. Phoenix, AZ.

______. 2015. Arizona Reptile and Amphibian Regulations 2015 & 2016. Arizona Game and Fish Department, Phoenix, Arizona. 9 pp.

______. 2017. Arizona Game and Fish Department 2017 & 2018 Fishing Regulations. Arizona Game and Fish Department, Phoenix, Arizona. 68 pp.

———. 2021a. Arizona Environmental Review Tool Report, Coolidge Expansion Project. Project ID: HGIS: 14893. Accessed October 2021.

———. 2021b. Wildlife Nongame Species, Nongame and Endangered Wildlife Program. Link to species abstracts. Available at: https://www.azgfd.com/Wildlife/NonGameManagement/. Accessed September 2021.

Arizona Game and Fish Department (AGFD) and Pinal County. 2019. *Pinal County Riparian Area Guidelines*. Available at: https://s3-us-west-2.amazonaws.com/azgfd-portal-wordpress-pantheon/wp-content/uploads/archive/PinalCounty_RiparianGuides_FINAL.pdf. Accessed November 2021.

Arnett, E.B., E.F. Baerwald, F. Mathews, L. Rodrigues, A. Rodriguez-Duran, J. Rydell, R. Villegas-Patraca, and C.C. Voigt. 2015. Impacts of wind energy development on bats: a global perspective. Pp. 295-323 in Bats in the Anthropocene: Conservation of Bats in a Changing World. Voigt, C.C., and T. Kingston. eds. Springer, New York.

Audubon. 2021. Important Bird Areas. Available at: https://www.audubon.org/important-bird-areas. Accessed October 5, 2021.

Avian Power Line Interaction Committee (APLIC). 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

———. 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*. Edison Electric Institute and APLIC, Washington, D.C.

Brennan, T.C. 2021. Reptiles and Amphibians of Arizona. Available at: http://www.reptilesofaz.org/. Accessed November 2021.

Corman, T.E., and C. Wise-Gervais. 2005. Arizona Breeding Bird Atlas. Albuquerque: University of New Mexico Press.

Cornell Lab of Ornithology. 2021. All About Birds: An online guide for bird identification, life history, and distribution. Available at: https://allaboutbirds.org. Accessed November 2021.

eBird. 2021. Explore. Available at: https://ebird.org/map. Accessed November 2021.

Google Earth. 2021. Satellite Imagery of the Project Area (32.917155°, -111.503163°). Accessed November 10, 2021.

iMap Invasives. 2021. Available at: https://www.imapinvasives.org/. Accessed November 2021.

Kesner, B.R., and P.C. Marsh. 2010. Central Arizona Project Fish Monitoring: Final Report. Analysis of Fish Population Monitoring Data for Selected Waters of the Gila River Basin, Arizona, for the Five Year Period 2005-2009. Contract No. R09PD32013. Submitted to U.S. Bureau of Reclamation. Tempe, Arizona: Marsh and Associates, LLC.

U.S. Fish and Wildlife Service (USFWS). 2021a. Information for Planning and Consultation (IPaC). Environmental Conservation Online System (ECOS) online environmental review tool. Consultation Code. Available at: https://ecos.fws.gov/ipac/. Accessed November 2021.

———. 2021b. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Mexican Gartersnake. *Federal Register* 86(80):22518–22580

———. 2021c. Birds of Conservation Concern. Available at: https://www.fws.gov/migratorybirds/pdf/management/birds-of-conservation-concern-2021.pdf. Accessed October 2021.

———. 2021d. Arizona Ecological Services. Available at: https://www.fws.gov/southwest/es/arizona/. Accessed November 2021.

Wildlife Conservation Society (WCS). 2021. Jaguar Observations Database. Available at: https://jaguardata.info/. Accessed November 2021.

EXHIBIT C-1 – USFWS IPAC

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This re **ECOS, including IPaC, will be down for a major maintenance event from 22:00 EST on Friday 11/12 through 08:00 EST on Monday 11/15. We apologize for any inconvenience this may cause. Thank you for your patience.** ×
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and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Pinal County, Arizona

Local office

Arizona Ecological Services Field Office

📞 (602) 242-0210
📠 (602) 242-2513

9828 North 31st Ave
#c3
Phoenix, AZ 85051-2517

http://www.fws.gov/southwest/es/arizona/
http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME STATUS

Yellow-billed Cuckoo Coccyzus americanus — Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/3911

Yuma Ridgways (clapper) Rail Rallus obsoletus [=longirostris] yumanensis — Endangered

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3505

Reptiles

NAME	STATUS
Northern Mexican Gartersnake Thamnophis eques megalops Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/7655	Threatened
Sonoran Desert Tortoise Gopherus morafkai Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9289	Candidate

Fishes

NAME	STATUS
Roundtail Chub Gila robusta No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2782	Candidate

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED,

WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bendire's Thrasher Toxostoma bendirei — Breeds Mar 15 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9435

Gila Woodpecker Melanerpes uropygialis — Breeds Apr 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/5960

Golden Eagle Aquila chrysaetos — Breeds Dec 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted

Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

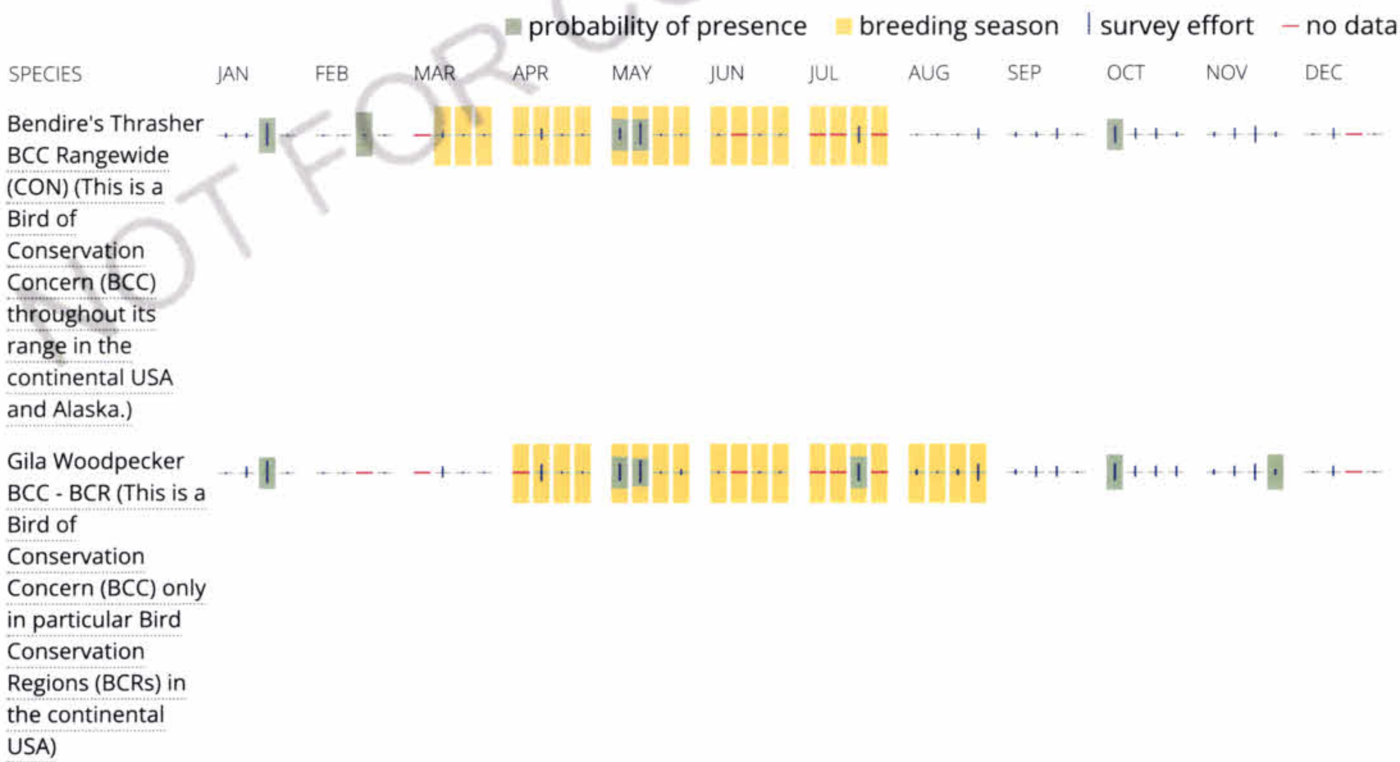
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Golden Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

- PSS1Ah

FRESHWATER POND

- PUBHx

RIVERINE

- R4SBJx
- R2UBHx
- R4SBJ

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

EXHIBIT C-2 – AGFD ONLINE ENVIRONMENTAL REVIEW TOOL

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Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:

Coolidge Expansion Project

User Project Number:

65028

Project Description:

The proposed Coolidge Expansion Project (CEP) involves the construction and operation of 16 new, natural gas fired, simple cycle aeroderivative combustion turbine generators (CTGs). A new 500kV switchyard will be constructed to the west of the new CTGs and new transmission lines will interconnect the proposed CTGs and switchyard with the certificated Pinal West to Southeast Valley/ Browning 500/230 kV transmission line constructed by SRP between the Pinal Central Substation and the Dinosaur Substation. The CEP also includes the addition of 7 wet surface air coolers (WSACs) for both the new CTGs and the 12 existing simple cycle CTGs SRP currently operates at this location. New evaporation ponds, water storage tanks, and various operation buildings and handling areas will also be constructed and/ or expanded.

Project Type:

Energy Storage/Production/Transfer, Energy Production (generation), gas power plant (expansion/modification)

Contact Person:

Stacy Campbell

Organization:

SWCA

On Behalf Of:

PRIVATE

Project ID:

HGIS-14893

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HabiMap Arizona data, specifically Species of Greatest Conservation Need (SGCN) under our State Wildlife Action Plan (SWAP) and Species of Economic and Recreational Importance (SERI), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

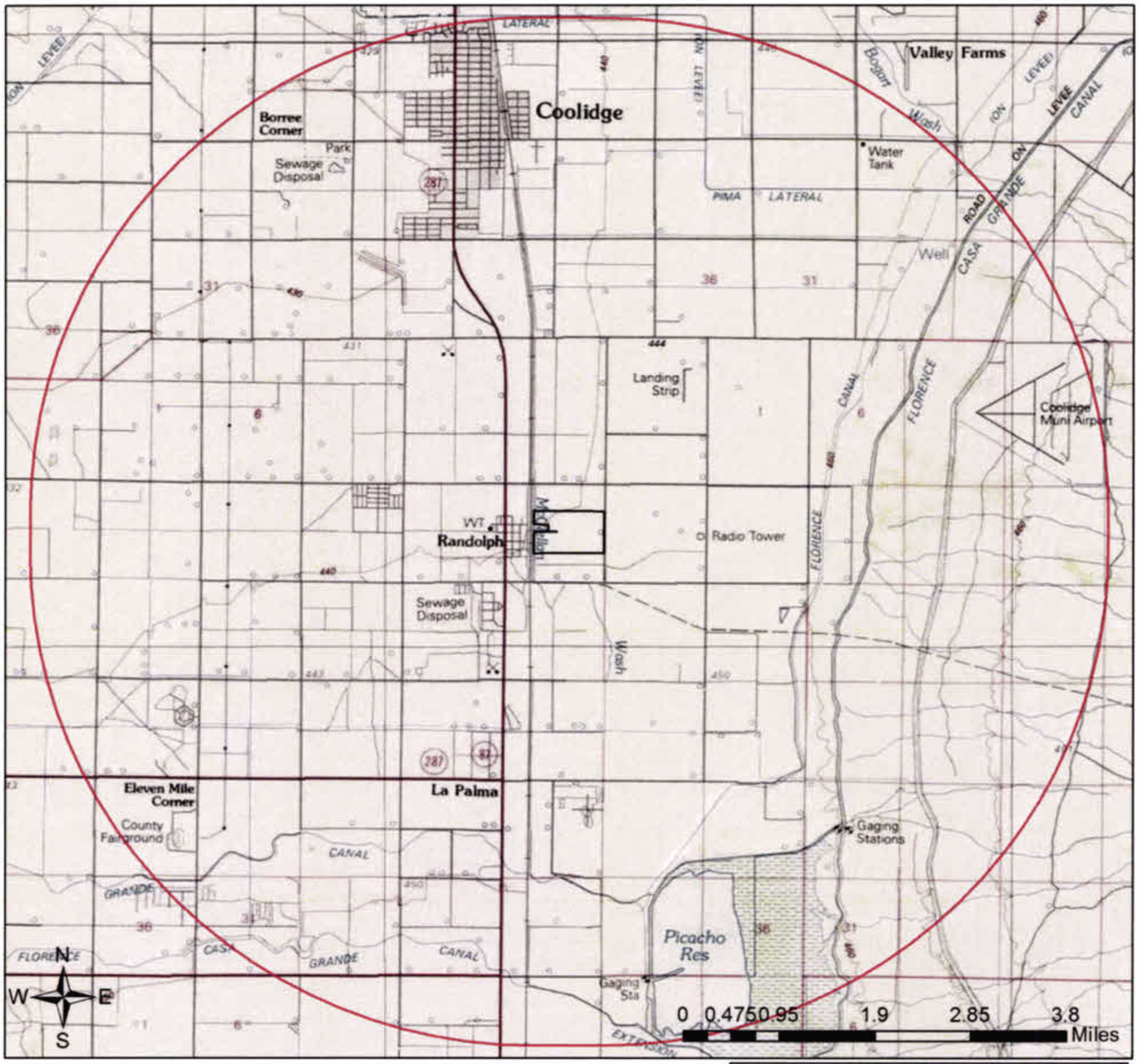
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies

Coolidge Expansion Project

USA Topo Basemap With Locator Map



Project Boundary

Buffered Project Boundary

Project Size (acres): 184.03

Lat/Long (DD): 32.9156 / -111.5038

County(s): Pinal

AGFD Region(s): Tucson

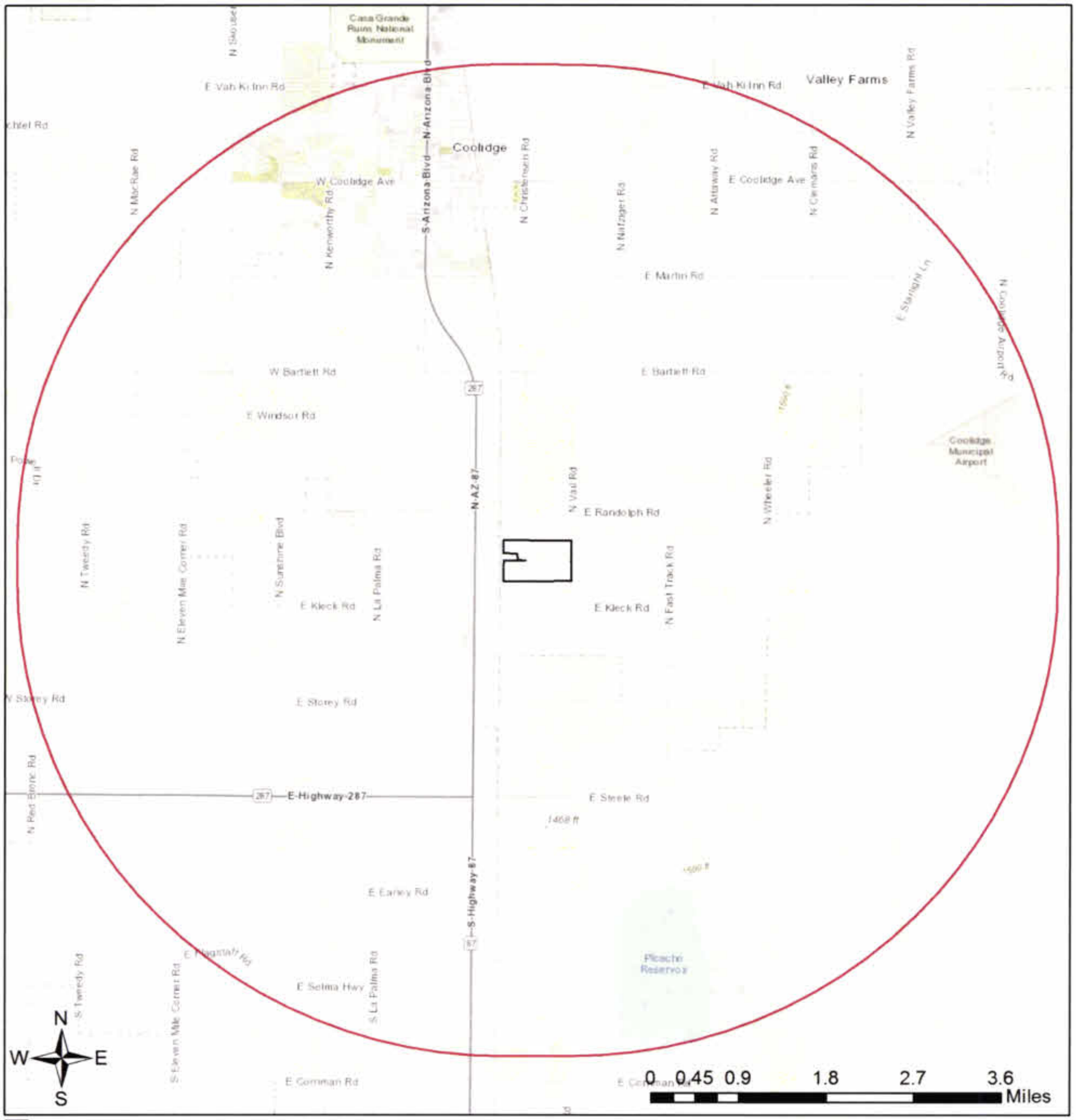
Township/Range(s): T6S, R8E

USGS Quad(s): COOLIDGE; VALLEY FARMS

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap

Coolidge Expansion Project

Web Map As Submitted By User



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Buffered Project Boundary

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Coolidge Expansion Project

Important Areas

- Project Boundary
- Buffered Project Boundary
- Wildlife Connectivity
- Important Connectivity Zones
- Pinal County Riparian
- Critical Habitat
- Important Bird Areas

Project Size (acres): 184.03

Lat/Long (DD): 32.9156 / -111.5038

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T6S, R8E

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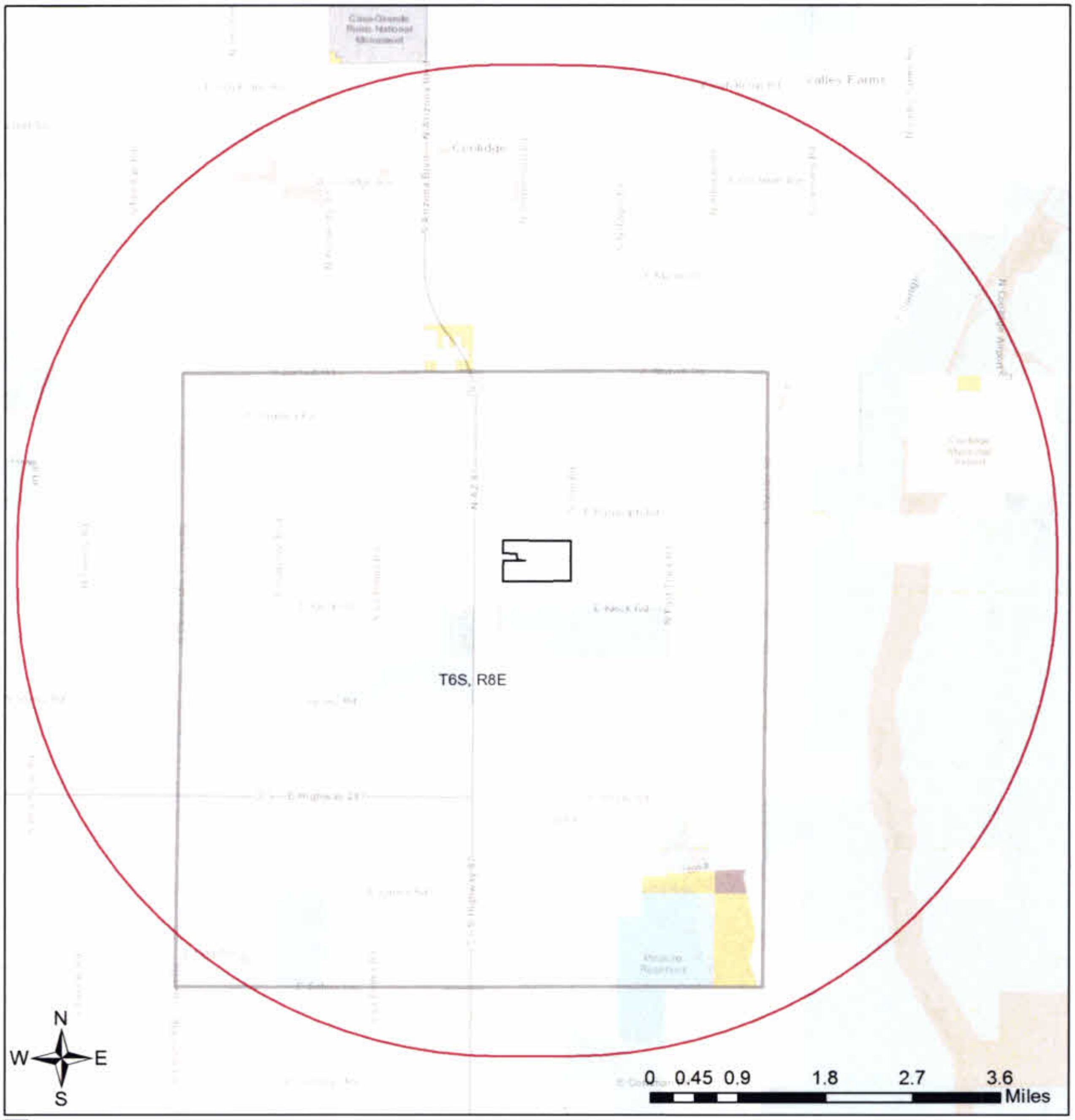
Coolidge Expansion Project

Township/Ranges and Land Ownership



Project Boundary

Buffered Project Boundary

Township/Ranges

Land Ownership

AZ Game & Fish Dept.

BLM

BOR

Indian Res.

Military

Mixed/Other

National Park/Mon.

Private

State & Regional Parks

State Trust

US Forest Service

Wildlife Area/Refuge

Project Size (acres): 184.03

Lat/Long (DD): 32.9156 / -111.5038

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T6S, R8E

USGS Quad(s): COOLIDGE; VALLEY FARMS

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Special Status Species Documented within 5 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Catostomus clarkii	Desert Sucker	SC	S	S		1B
Coccyzus americanus	Yellow-billed Cuckoo (Western DPS)	LT	S	S		1A
Empidonax traillii extimus	Southwestern Willow Flycatcher	LE				1A
Lepus alleni	Antelope Jackrabbit					1B
Rallus obsoletus yumanensis	Yuma Ridgway's Rail	LE		S		1A

Note: Status code definitions can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/
.

Special Areas Documented that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Riparian Area	Riparian Area					

Note: Status code definitions can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/
.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Aix sponsa	Wood Duck					1B
Ammospermophilus harrisii	Harris' Antelope Squirrel					1B
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B
Calypte costae	Costa's Hummingbird					1C
Chilomeniscus stramineus	Variable Sandsnake					1B
Chionactis annulata	Resplendent Shovel-nosed Snake	SC				1C
Cistothorus palustris	Marsh Wren					1C
Colaptes chrysoides	Gilded Flicker			S		1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Crotalus tigris	Tiger Rattlesnake					1B
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus blossevillii	Western Red Bat		S			1B
Lasiurus xanthinus	Western Yellow Bat		S			1B

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Leptonycteris yerbabuenae	Lesser Long-nosed Bat	SC				1A
Lepus alleni	Antelope Jackrabbit					1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolnii	Lincoln's Sparrow					1B
Melozone aberti	Abert's Towhee		S			1B
Micrathene whitneyi	Elf Owl					1C
Micruroides euryxanthus	Sonoran Coralsnake					1B
Myiarchus tyrannulus	Brown-crested Flycatcher					1C
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Oreoscoptes montanus	Sage Thrasher					1C
Oreothlypis luciae	Lucy's Warbler					1C
Panthera onca	Jaguar	LE				1A
Passerculus sandwichensis	Savannah Sparrow					1B
Phrynosoma goodei	Goode's Horned Lizard					1B
Phrynosoma solare	Regal Horned Lizard					1B
Rallus obsoletus yumanensis	Yuma Ridgway's Rail	LE				1A
Setophaga petechia	Yellow Warbler					1B
Spizella breweri	Brewer's Sparrow					1C
Sturnella magna	Eastern Meadowlark					1C
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Toxostoma lecontei	LeConte's Thrasher			S		1B
Troglodytes pacificus	Pacific Wren					1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	Kit Fox	No Status				1B

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning Dove					

Project Type: Energy Storage/Production/Transfer, Energy Production (generation), gas power plant (expansion/modification)

Project Type Recommendations:
Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, canted, or cut to ensure that light reaches only areas needing illumination.

Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at https://www.invasivespeciesinfo.gov/unitedstates/az.shtml and the Arizona Native Plant Society https://aznps.com/invas for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at https://imap.natureserve.org/imap/services/page/map.html.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select "See What's Here" for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

Follow manufacturer's recommended application guidelines for all chemical treatments. The U.S. Fish and Wildlife Service, Region 2, Environmental Contaminants Program has a reference document that serves as their regional pesticide recommendations for protecting wildlife and fisheries resources, titled "Recommended Protection Measures for Pesticide Applications in Region 2 of the USFWS",
http://www.fws.gov/southwest/es/arizona/Documents/ECReports/RPMPA_2007.pdf. The Department recommends that direct or indirect impacts to sensitive species and their forage base from the application of chemical pesticides or herbicides be considered carefully.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

Based on the project type entered, coordination with the Environmental Protection Agency may be required (http://www.epa.gov/).

For any powerlines built, proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws. Limit project activities during the breeding season for birds, generally March through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season. For underground powerlines, trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches. In addition, indirect affects to wildlife due to construction (timing of activity, clearing of rights-of-way, associated bridges and culverts, affects to wetlands, fences) should also be considered and mitigated.

Based on the project type entered, coordination with State Historic Preservation Office may be required (http://azstateparks.com/SHPO/index.html).

Based on the project type entered, coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered, coordination with Arizona Department of Water Resources may be required (https://new.azwater.gov/).

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly at PEP@azgfd.gov.

Avoid/minimize wildlife impacts related to contacting hazardous and other human-made substances in facility water collection/storage basins, evaporation or settling ponds and/or facility storage yards. Design slopes to discourage wading birds and use fencing, netting, hazing or other measures to exclude wildlife.

The Department encourages the use of technology that requires minimal amounts of water, preferably dry cooling. In the desert, water is very scarce and reducing consumption will lessen impacts on wildlife as well as the public.

Project Location and/or Species Recommendations:
HDMS records indicate that one or more **Listed, Proposed, or Candidate** species or **Critical Habitat** (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at http://www.fws.gov/southwest/es/arizona/ or:

Phoenix Main Office	**Tucson Sub-Office**	**Flagstaff Sub-Office**
9828 North 31st Avenue #C3	201 N. Bonita Suite 141	SW Forest Science Complex
Phoenix, AZ 85051-2517	Tucson, AZ 85745	2500 S. Pine Knoll Dr.
Phone: 602-242-0210	Phone: 520-670-6144	Flagstaff, AZ 86001
Fax: 602-242-2513	Fax: 520-670-6155	Phone: 928-556-2157
		Fax: 928-556-2121

This review has identified **riparian areas** within the vicinity of your project. During the planning stage of your project, avoid, minimize, or mitigate any potential impacts to riparian areas identified in this report. Riparian areas play an important role in maintaining the functional integrity of the landscape, primarily by acting as natural drainages that convey water through an area, thereby reducing flood events. In addition, riparian areas provide important movement corridors and habitat for fish and wildlife. Riparian areas are channels that contain water year-round or at least part of the year. Riparian areas also include those channels which are dry most of the year, but may contain or convey water following rain events. All types of riparian areas offer vital habitats, resources, and movement corridors for wildlife. The Pinal County Comprehensive Plan (i.e. policies *6.1.2.1* and *7.1.2.4*), Open Space and Trails Master Plan, Drainage Ordinance, and Drainage Design Manual all identify riparian area considerations, guidance, and policies. Guidelines to avoid, minimize, or mitigate impacts to riparian habitat can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/. Based on the project type entered, further consultation with the Arizona Game and Fish Department and Pinal County may be warranted.

HDMS records indicate that **Western Burrowing Owls** have been documented within the vicinity of your project area. Please review the western burrowing owl resource page at: https://www.azgfd.com/wildlife/speciesofgreatestconservneed/burrowingowlmanagement/.

EXHIBIT C-3 – AGFD REVIEW OF THE SRP COOLIDGE GENERATING STATION-COOLIDGE EXPANSION PROJECT

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November 9, 2021

Bill McClellan
Project Manager
Salt River Project
1500 N. Mill Ave.
Tempe, AZ 85281

Electronically submitted to: bill.mcclellan@srpnet.com

RE: SPR Coolidge Generating Station- Coolidge Expansion Project

Dear Mr. McClellan:

The Arizona Game and Fish Department (Department) appreciates the opportunity to review Salt River Project's (SRP's) Coolidge Expansion Project. This project includes the construction of up to 820 megawatts (MW) of new power generation, produced by 16 gas turbines, adjacent to the existing Coolidge Generating Station. The Coolidge Generating Station is situated just east of SR 87, and south of E. Randolph Road, in Coolidge, Arizona. Current land use within the expansion area consists of agricultural field crops.

Under Title 17 of the Arizona Revised Statutes, the Department, by and through the Arizona Game and Fish Commission (Commission), has jurisdictional authority and public trust responsibilities to protect and conserve the state fish and wildlife resources. In addition, the Department manages threatened and endangered species through authorities of Section 6 of the Endangered Species Act and the Department's 10(a)1(A) permit. It is the mission of the Department to conserve and protect Arizona's diverse fish and wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations. For your consideration, the Department provides the following comments based on the agency's statutory authorities, public trust responsibilities, and special expertise related to wildlife resources and recreation.

Based on the information provided on your website, and presented during a virtual public meeting that Department staff attended on October 21, 2021, the Department has the following recommendation:

- The western burrowing owl (*Athene cunicularia hypugaea*), a special status species that is regulated under the Migratory Bird Treaty Act (MBTA), has been recorded in the vicinity of your project. The Department recommends conducting an occupancy survey for western burrowing owl to determine if this species occurs within your project footprint. Guidelines for conducting this survey are found in *Burrowing Owl Project Clearance Guidance for*

Landowners[1] which can be accessed on-line through the Department's website. Please note that the survey should be conducted by a surveyor that is certified by the Department. If an active burrowing owl burrow is detected, please contact the Department and the U.S. Fish and Wildlife Service for direction, in accordance with the *Burrowing Owl Project Clearance Guidance for Landowners*.

Thank you for the opportunity to provide input on the SPR Coolidge Generating Station-Coolidge Expansion Project. For further coordination, please contact Cheri Bouchér at cboucher@azgfd.gov or 623-236-7615.

Sincerely,

Ginger Ritter

Ginger Ritter
Project Evaluation Program Supervisor

AGFD # M21-10152643

[1] https://www.azgfd.com/wildlife/speciesofgreatestconservneed/raptor-management/burrowing-owl-mangement/

EXHIBIT D – BIOLOGICAL RESOURCES

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:
List the fish, wildlife, plant life, and associated forms of life in the vicinity of the proposed site or route and describe the effects, if any, the proposed facilities will have thereon.

Introduction

To identify the plant and wildlife species that may occur in the vicinity of the proposed Project, SWCA consulted publicly available data sources, including:

- Topographical and aerial maps
- AGFD Online Environmental Review Tool (AGFD 2021a)
- *Biotic Communities: Southwestern United States and Northwestern Mexico* (Brown 1994)
- Regional checklists, reports, and publications (e.g., Brennan and Holycross 2006; eBird 2021; Hoffmeister 1986; iNaturalist 2021; Kesner and Marsh 2010)

In addition, an SWCA biologist with expertise in the biology of flora and fauna of the region surveyed the Project Area on May 25, 2021, although the fenced in portion comprising the existing generating station was not entered. All plants and wildlife observed in the Project Area were recorded during the survey.

Results

Ecological Setting

The Study Area is located within the Lower Colorado River Valley subdivision of the Sonoran Desertscrub Biotic Community (Brown 1994) with an elevational range of approximately 1,430 to 1,500 feet above mean sea level (amsl). The Project Area is located 0.3 mile east of SR 87/SR 287, 0.3 mile south of East Randolph Road, and 0.3 mile north of East Kleck Road. Land uses in the Study Area and vicinity include agriculture, residential, and industrial development. A UPRR track bisects the Study Area just west of the Project Area. The Florence Canal, Casa Grande Canal, and Salt-Gila Aqueduct (part of the CAP) run approximately north–south 0.2, 0.6, and 1.4 miles west of the Study Area, respectively. The Picacho Reservoir lies 3.3 miles south-southeast of the Project Area. Picacho Reservoir has a highly variable water level, with the lake being entirely dry in some years (Drowley 2021).

Vegetation

Much of the Project Area and Study Area consists of in-use agricultural fields, with a portion of the Study Area consisting of desertscrub with varying levels of disturbance. At the time of surveys, crops grown in the Project Area included cotton (*Gossypium* sp.).

Within the Project Area, desertscrub vegetation, grasses, forbs, and weeds grew in stringers outside of agricultural fields. One velvet mesquite (*Prosopis velutina*) individual was observed. Native species observed in and around the fields included burrobush (*Ambrosia dumosa*), carelessweed (*Amaranthus palmeri*), cheeseweed mallow (*Malva parviflora*), desertbroom (*Baccharis sarothroides*), lambsquarters (*Chenopodium album*), Mexican sprangletop (*Leptochloa fusca* ssp. *uninervia*), knotweed (*Polygonum* sp.), and turpentinebush (*Ericameria laricifolia*).

Nonnative species observed included Asian mustard (=Saharan mustard), Athel tamarisk (*Tamarix aphylla*), common sowthistle (*Sonchus oleraceous*), eucalyptus (*Eucalyptus* sp.) trees, Mediterranean grass (*Schismus* sp.), prickly Russian thistle (*Salsola tragus*), redstem stork's bill (*Erodium cicutarium*), saltcedar, and stinknet. Asian mustard, saltcedar, and stinknet are species listed as Arizona noxious weeds. The eucalyptus trees were landscaped plants along roads.

Bermudagrass and prickly Russian thistle were widespread and occurred commonly in the margins of the agricultural fields and on the sides of existing roads. There were landscaped trees, including tall eucalyptus trees, along roads within the Project Area.

No broadleaf deciduous riparian vegetation communities (i.e., communities containing willow [*Salix* sp.], cottonwood [*Populus* sp.], or ash [*Fraxinus* sp.], etc.), or potential bat roost sites (e.g., natural caves, mine features, abandoned buildings, or palm trees) were observed during surveys. Concrete-lined canals with flowing water were located in some portions of the Project Area, and small portions of fields were flooded with irrigation at the time of field survey.

Wildlife Species

Bird species observed in the portion of the Project Area visited in May 2021 included brown-headed cowbird (*Molothrus ater*), common raven (*Corvus corax*), curve-billed thrasher (*Toxostoma curvirostre*), Gambel's quail (*Callipepla gambelii*), great-tailed grackle (*Quiscalus mexicanus*), house finch (*Haemorhous mexicanus*), house sparrow (*Passer domesticus*), killdeer (*Charadrius vociferus*), mourning dove (*Zenaida macroura*), Say's phoebe (*Sayornis saya*), and western burrowing owl.

Other wildlife observed included desert cottontail (*Sylvilagus audubonii*) and American bullfrog (*Lithobates catesbeianus*), a nonnative species, which was observed dead near a concrete-lined canal.

Species that may occur in the Study Area are listed in Table D-1 (mammals), Table D-2 (birds), Table D-3 (reptiles), and Table D-4 (amphibians). Species were considered for their potential to occur as follows. A list of mammal species typical of Lower Colorado River Valley subdivision of the Sonoran Desertscrub biotic community evaluated for this report included mammals found in Table 4.1 in *Mammals of Arizona* (Hoffmeister 1986). Bird species evaluated in this report include those listed for Sonoran Desertscrub in Appendix II of *Biotic Communities Southwestern United States and Northwestern Mexico* (Brown 1994) and a list of Sonoran Desert Birds in iNaturalist (2021). Reptiles and amphibians evaluated in this report were taken from a list of commonly occurring species in the Lower Colorado River Valley subdivision of the Sonoran Desertscrub biotic community in Amphibians and Reptiles in Arizona (Brennan and Holycross 2006). Finally, fish species evaluated in this report were taken from the list of species in the CAP and Florence-Casa Grande Canals from the *Central Arizona Project Fish Monitoring Final Annual Report* (Kesner and Marsh 2010)

Some species from these lists of typical species overlap with special-status species evaluated in Exhibit C, and these species have been removed from consideration in Exhibit D because they have already been addressed (see Exhibit C). Occurrence records were obtained from the AGFD Online Environmental Review Tool (AGFD 2021a), *Mammals of Arizona* (Hoffmeister 1986), eBird (2021), and the *Breeding Bird Atlas* (Corman and Wise-Gervais 2005).

MAMMALS

Large mammal species would be rare in the Study Area because it is largely disturbed and is surrounded by agriculture, roads, and development. Small- and medium-sized terrestrial mammal species may occur. Bat species have the potential to disperse or migrate through or forage within the Study Area. No caves, mines, or adits occur in the Study Area that could serve as bat roosts. Although no palm trees, abandoned buildings, or riparian vegetation was observed in the Project Area, these types of potential bat roosts could occur in the portions of the Study Area that were not surveyed.

Table D-1. Mammal Species that May Occur in the Study Area

Common Name (*Scientific Name*)	**Habitat**
Arizona pocket mouse (*Perognathus amplus*)	Desertscrub habitats.
Black-tailed jackrabbit (*Lepus californicus*)	Open habitat with scattered patches of shrubs, including plains, fields, and deserts.
Botta's pocket gopher (*Thomomys bottae*)	Extremely xeric locations, below 11,000 feet amsl with variable soils and ground cover ranging from open to grasslands. Occurs in roadsides, valleys, and mountain meadows.
Cactus mouse (*Peromyscus eremicus*)	Deserts and pinyon-juniper (*Pinus* spp.–*Juniperus* spp.), Occurs in rocky, sandy, or loamy soils. Found in rock heaps, stone walls, burrows, woodrat houses, and brush fences.
Coyote (*Canis latrans*)	All habitat types, including agricultural, urban, and suburban areas.
Desert cottontail (*Sylvilagus audubonii*)	Grasslands, brushlands, edges of foothill woodlands, willow thickets, and occasionally in cultivated fields or under buildings.
Desert kangaroo rat (*Dipodomys deserti*)	Low deserts, often sandy soil with sparse vegetation including alkali sink, shadscale scrub, and creosote bush.
Desert pocket mouse (*Chaetodipus penicillatus*)	Sparsely vegetated sandy desert floors.
Javelina (=collared peccary) (*Dicotyles tajacu*)	Deserts, shrublands, cities, and agricultural areas.
Merriam's kangaroo rat (*Dipodomys merriami*)	Low deserts in sparsely vegetated areas.
Round-tailed ground squirrel (*Xerospermophilus tereticaudus*)	Sonoran desertscrub, alkali sink and creosote bush communities, low flat areas and avoids rocky hills
Striped skunk (*Mephitis mephitis*)	Usually live in areas near water, including rivers, streams, and irrigated places. Live in natural cavities, burrows dug by other species, and human-made structures.
Western harvest mouse (*Reithrodontomys megalotis*)	A wide variety of habitats in places with adequate cover. Often live in areas with adequate grass cover, along streams, bottomlands, along fences, or around irrigated areas.
White-throated woodrat (*Neotoma albigula*)	Brushlands, rocky cliffs, creosote bush scrub, mesquite-yucca, and pinyon-juniper woodland.
Bat Species	
Big brown bat (*Eptesicus fuscus*)	Variable habitat, from ponderosa pine (*Pinus ponderosa*) forests, pinyon-juniper woodlands, the lower edge of spruce-fir (*Picea* spp.- *Abies* spp.) forests, and Lower Sonoran zones. Migratory; found throughout the state in summer, and in southern Arizona in the winter. Roosts in buildings, bridge joints, mines, hollow trees, and caves.
California leaf-nosed bat (*Macrotus californicus*)	Primarily found in Sonoran desertscrub; summer and winter range essentially the same; roosts in mines, caves, and rock shelters.
California myotis (*Myotis californicus*)	Desert ranges and flatlands; desertshrub-oak (*Quercus* spp.) to ponderosa pine zones. Migratory; winter distribution in southern Arizona, south of the Gila River. Roosts in crevices and cracks in canyon walls, caves and mine shafts, and under bark in trees or snags.
Pallid bat (*Antrozous pallidus*)	Many habitat types, including forests, canyons, open farmland, and deserts. Migratory; occurs throughout Arizona and in the southern part of the state in winter. Roosts in rock crevices, buildings, caves, and mines.

Source: Range or habitat information is from AGFD (2021a, 2021b); Hoffmeister (1986); NatureServe Explorer (2021).

*Observed during field reconnaissance

BIRDS

The Lower Colorado River Valley subdivision of the Sonoran Desertscrub biotic community generally consists of open, sparsely vegetated habitats that do not support a bird community as diverse as found in other subdivisions of Sonoran desertscrub (Brown 1994). Active agricultural fields can also support many bird species. Birds have potential to use the Study Area for their life-history needs (i.e., foraging, nesting, or perching). Waterfowl and other birds may use the existing and planned new evaporation ponds within the Project Area as loafing ponds—midday stops where birds rest before feeding or heading back to the roost. Other birds may be attracted to the water in the evaporation ponds, but not use the area for nesting, roosting, foraging, or reproduction. Birds that are likely to only be attracted to the existing and planned evaporation ponds, as well as those that are just dispersing or migrating through the Study Area are not included in the following table. Table D-2 lists the bird species that may occur in the Study Area.

Table D-2. Bird Species that May Occur in the Study Area

Common Name (*Scientific Name*)	Habitat
American kestrel (*Falco sparverius*)	A variety of habitats with open settings with scattered trees or other structures for perching. Year-round resident.
Anna's hummingbird (Calypte anna)	Occurs in chaparral, coastal scrub, oak savannas, and open woodland. Also common in urban and suburban settings.
Ash-throated flycatcher (*Myiarchus cinerascens*)	Dry scrub, open woodlands, and deserts. Cavity nester that breeds in this part of Arizona.
Black vulture (*Coragyps atratus*)	Occurs in a wide variety of habitats. Typically occurs in riparian woodlands and desertscrub where saguaros (*Carnegiea gigantea*) and tall trees occur. Also occurs in rural and agricultural fields, and prefers elevated perches including trees, saguaros, telephone poles, or transmission towers.
Brewer's blackbird (*Euphagus cyanocephalus*)	Often occurs near human habitation. Occurs in shrubby and busy areas near water, riparian woodland, cultivated lands, and marshes. Winters south of Mogollon Rim.
Brown-headed cowbird (*Molothrus ater*)	Often associated with human-modified, fragmented landscapes, and are attracted to feedlots, pastures, and fields. Occurs in a variety of habitats including desertscrub, agricultural lands, and residential areas. Migratory, present in Arizona spring–fall.
Cactus wren (*Campylorhynchus brunneicapillus*)	Associated with desertscrub communities. Although they are commonly associated with cholla (*Cylindropuntia* spp.), they occur in areas lacking cholla also. Can occur in dry, sparsely vegetated areas. Year-round resident.
Common raven* (*Corvus corax*)	Found in most habitat types, select open areas. Regularly encountered in rural, agricultural, and urbans settings. Year-round resident.
Cooper's hawk (*Accipiter cooperii*)	Occurs in woodlands, parks, neighborhoods, and fields, associated with trees.
European starling† (*Sturnus vulgaris*)	Occurs predominantly near human settlements, in rural, urban, and agricultural fields. Year-round resident.
Gambel's quail* (*Callipepla gambelii*)	Typically associated with brushy Sonoran Desert uplands and desert washes. Can also occur in residential areas and along the margins of cultivated lands. Year-round resident.
Great-tailed grackle* (*Quiscalus mexicanus*)	Occurs in partly open situations with scattered trees, around human habitation. Year-round resident.
Greater roadrunner (*Geococcyx californianus*)	Occurs in open, arid country with scattered shrubs, trees, or cacti. Also common in agricultural areas and urban and suburban settings. Year-round resident.
Harris hawk (Parabuteo unicinctus)	Semi-open desert lowlands; territories include tall perches (e.g., trees, power poles, or boulders) and access to water.
House finch* (*Carpodacus mexicanus*)	Occurs in arid scrub and brush, open woodland, oak-juniper, and pine-oak habitats, and towns and cultivated lands. Year-round resident.

Common Name (*Scientific Name*)	Habitat
House sparrow* [†] (*Passer domesticus*)	Introduced species that occurs abundantly in cities and towns. Occurs in feedlots, agricultural areas, and urban and rural communities. Year-round resident.
Inca dove (*Columbina inca*)	Open country, urban, and agricultural areas. Year-round resident.
Lesser goldfinch (*Spinus psaltria*)	Patchy open habitats, including thickets, weedy fields, woodland, scrubland, and farmlands.
Lesser nighthawk (*Chordeiles acutipennis*)	Found in arid lowlands, deserts, and agricultural areas. Nests on the ground, usually beneath a shrub but sometimes out in the open. Migratory, present in Arizona spring–fall.
Mourning dove* (*Zenaida macroura*)	Occurs in a wide variety of habitats, most regularly in desertscrub, shrubby grasslands, and open woodlands. Also found in rural and urban habitats.
Northern cardinal (*Cardinalis cardinalis*)	Dense shrubby areas including overgrown fields, backyards, mesquite, thickets, and ornamental landscaping.
Northern mockingbird (*Mimus polyglottos*)	Prefers open and partly open situations. Occurs in areas of scattered brush or trees to semidesert, and around towns and cultivated areas.
Phainopepla (*Phainopepla nitens*)	Occurs in Arizona during the breeding season. Desert washes, where they feed heavily on desert mistletoe berries.
Red-tailed hawk (*Buteo jamaicensis*)	Occurs in a wide variety of open habitats. Elevated perches are important. Year-round resident.
Red-winged blackbird (*Agelaius phoeniceus*)	Nests near water. During migration and wintering can also occur in cultivated lands, pastures, and prairies. May be year-round or migratory.
Rock pigeon[†] (*Columba livia*)	Introduced. Closely associated with human settlement, such as towns, parks, and agricultural areas. Year-round resident.
Swainson's hawk (*Buteo swainsoni*)	Occurs in open pine-oak woodland and cultivated lands. Migratory, breeds in Arizona.
Turkey vulture (*Cathartes aura*)	Widespread, and uses a variety of habitats. Commonly perch on rocky outcrops, cliffs, canyon walls, transmission towers, telephone poles, and tall trees. Migratory.
Waterfowl and occasional-use birds	Waterfowl and other birds may use the existing and planned new evaporation ponds within the Project Area as loafing ponds—midday stops where birds rest before feeding or heading back to the roost. Other birds may be attracted to the water in the evaporation ponds, but not use the area for nesting, roosting, foraging, or reproduction.
Western kingbird (*Tyrannus verticalis*)	Prefers open areas in many habitat types including desert, rural, and agricultural areas. Migratory.
White-crowned sparrow (*Zonotrichia leucophrys*)	Occurs in woodlands, shrubland, croplands, suburbs, old fields, and conifer woodlands.
White-winged dove (*Zenaida asiatica*)	Habitat generalist, including desertscrub, riparian, urban, and agricultural areas. Year-round resident.
Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)	Breeds near freshwater marshes. In migration or winter, occurs in open cultivated lands, pastures, and fields. Wintering and migratory only in Project Area.

Source: Range or habitat information is from Corman and Wise-Gervais (2005); eBird (2021); NatureServe Explorer (2021).

*Observed in Project Area during field reconnaissance

[†]Nonnative species

REPTILES

The Lower Colorado River Valley subdivision of the Sonoran Desert biotic community is home to many reptile species (Brown 1994). Many species typical of this biotic community would be unlikely to occur in the agricultural fields or within the previously disturbed areas, due to a lack of vegetation or other habitat components, but could occur in the portions of the Study Area containing native vegetation. Table D-3 lists the reptile species that may occur in the Study Area.

Table D-3. Reptile Species that May Occur in the Study Area

Common Name (*Scientific Name*)	Habitat
Reptiles	
Coachwhip (*Coluber flagellum*)	Typically occurs in desertscrub and semidesert grasslands. Used a wide range of habitats including desert, prairie, scrubland, woodland, farmland, and creek valleys, generally in dry, open terrain.
Desert horned lizard (*Phrynosoma* [*Doliosaurus*] *platyrhinos*)	Occurs in desertscrub communities in flat, open areas with sparse vegetation. Can also be found on rocky bajadas and hillside.
Desert iguana (*Dipsosaurus dorsalis*)	Primarily in Mohave desertscrub and Lower Colorado River Subdivision of Sonoran desertscrub, and occasionally in Arizona Upland Subdivision of Sonoran desertscrub. Occurs on flatlands and gently sloping bajadas.
Desert nightsnake (*Hypsiglena chlorophaea*)	Ranges from flat, open sandy deserts to steep, rocky, and wooded slopes.
Gophersnake (*Pituophis catenifer*)	Found in biotic communities up to Alpine Tundra. Occurs in deserts, forests, and coastal grasslands.
Long-nosed snake (*Rhinocheilus lecontei*)	Occurs in deserts, dry prairies, arid river valleys, thornbrush, and shrubland.
Mojave rattlesnake (*Crotalus scutulatus*)	Occurs in desertscrub and semidesert grasslands. Found in upland desert and lower mountain slopes, barren desert, grassland, open woodland, and scrublands. Most often occurs with creosote bush, paloverde, mesquite, or cacti.
Sidewinder (*Crotalus cerastes*)	Typically occurs in flat, open desert with sandy or loamy soils.
Tiger whiptail (*Aspidoscelis tigris*)	Occurs in a wide variety of habitats including creosote bush flats, sandy wash, canyons, and hillsides. Found in desertscrub, semidesert grasslands, and lower reaches of chaparral.
Zebra-tailed lizard (*Callisaurus draconoides*)	Primarily in desertscrub. Occurs in flatlands and broad, sandy washes.
Western banded gecko (*Coleonyx variegatus*)	Ranges from dry creosote flats to rugged, rocky slopes to barren high desert plateaus.

Range or habitat information is from AGFD (2021a, 2021b); Brennan (2021); NatureServe Explorer (2021).

AMPHIBIANS

There are no perennial water sources within the Study Area. One amphibian species, the nonnative American bullfrog, was observed during the May 2021 field visit. The individual was found dead near a concrete irrigation canal within the Project Area. Additional amphibian species have the potential to occur within the Study Area in any location that accumulates water, including concrete irrigation canals, roadside puddles or depressions following monsoon rains, or within agricultural fields during flood irrigation. Amphibians could also occur in mud cracks, mammal burrows, or structures within the Study Area to avoid desiccation. Table D-4 lists the amphibian species that may occur in the Study Area.

Table D-4. Amphibian Species that May Occur in the Study Area

Common Name (*Scientific Name*)	Habitat
Amphibians	
Couch's spadefoot (*Scaphiopus couchii*)	In the United States, found in arid and semi-arid shrublands, shortgrass plains, mesquite savanna, creosote bush desert, thorn forest, and cultivated areas. Individuals are typically buried underground except during and for a short time following monsoon rains.

Range or habitat information is from AGFD (2021a); Brennan (2021); NatureServe Explorer (2021).

FISH SPECIES

There is no perennial aquatic habitat in or near the Study Area. The nearest perennial water is the Picacho Reservoir located approximately 3.3 miles south-southeast of the Project Area. However, introduced fish have the potential to occur within the Study Area in the concrete-lined canals. Many of these fish represent invasive species that have been released or sportfish that have been stocked into waterways connected to the canals. No native fish species would be expected to occur.

The CAP canal and the Florence-Casa Grande Canal have the potential to be supplying water to agricultural portions of the Project Area through diversion into the concrete-lined canals. Fish from the larger canals could be swept into the concrete-lined canals; however, these canals are unlikely to constitute suitable habitat for any of these species that would support long-term life-history functions (e.g., foraging, reproduction). Both the Florence-Casa Grande Canal and the CAP canal are known to carry fish, though none of the fish caught in a 2005–2009 study were native to the Gila River basin (Kesner and Marsh 2010). The following fish were observed in the Florence-Casa Grande Canal and the CAP canal during the 2005–2009 study (Kesner and Marsh 2010): bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), common carp (*Cyprinus carpio*), flathead catfish (*Pylodictis olivaris*), grass carp (*Ctenopharyngodon idella*), green sunfish (*Lepomis cyanellus*), mosquitofish (*Gambusia affinis*), redear sunfish (*Lepomis microlophus*), red shiner (*Cyprinella lutrensis*), striped bass (*Morone saxatilis*), smallmouth bass (*Micropterus dolomieu*), and threadfin shad (*Dorosoma petenense*).

Summary of Potential Effects

Plant Species

The construction footprint for the Project Area outside of the existing Coolidge Generating Station site is approximately 100 acres. Some or all of the vegetation within the Project Area is expected to be removed during Project construction activities. This relatively small area is entirely previously disturbed by agricultural uses and other development, and the loss of vegetation in the Project Area would not result in impacts to the Lower Colorado River Valley subdivision of the Sonoran desertscrub biotic community native vegetation community at the landscape level. In addition, construction and operation of the Project would result in an increase of emissions including fugitive dust, VOCs, CO, oxides of nitrogen, particulate matter, SO_2, and CO_2 (see Exhibit B for details). The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS. Therefore, impacts to plant species would be minor. The likelihood and severity of these impacts from air emissions would decrease with increasing distance from the Project Area.

Mammal Species

Project construction activities could cause death or injury to terrestrial mammals that may not be able to flee from heavy equipment or vehicular traffic, with a higher likelihood of these impacts for individuals of species that are small, nocturnal, or fossorial. Project construction could cause behavior changes, as individuals would be expected to flee from an increase of noise, vibration, and human presence within the project vicinity. Individuals would be expected to flee or hide, depending on the species' life history, which could increase depredation, decrease foraging success, reduce reproductive success, and result in loss of fitness for that individual from increased metabolic output. Project construction activities would be temporary. The loss and degradation of mammal habitat from short-and long-term Project activities would be negligible as the Project Area is relatively small, contains little vegetation, and is entirely disturbed. Similarly, because the Study Area is largely disturbed and contains in-use agricultural fields and is surrounded by agriculture, roads, and development, any loss of vegetation from construction activities would not contribute meaningfully to habitat fragmentation for mammals or decrease connectivity from between habitats.

Project activities at night would increase light pollution and human presence in the Study Area and would impact bat activity patterns. The increase of nighttime lighting in the Project Area has the potential to attract insects, which could have minor beneficial impacts to some bat species as their food source increased. However, some bat species would likely shift their foraging activities away from construction and additional light. However, these negative impacts would likely be minor because foraging habitat for insectivorous species occurs outside of the Study Area. Some roosting habitat may occur in the Survey Area outside of the Project Area, and contracting qualified biologists to inspect any palm trees or large riparian or ornamental trees or abandoned buildings would reduce the potential for bat disturbance. Insectivorous bat species would lose a small area of habitat as many species have the potential to forage over the Study Area, which contains water and therefore likely abundant insect populations. However, the loss of habitat in the Study Area is unlikely to have population-level impacts to any bat species because the area of disturbance is relatively small compared with the available habitat outside of the Study Area.

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals.

Impacts to mammals would not be expected to arise from water quality within the existing or new evaporation ponds, as these features are fenced and mammals would not be expected to use these ponds.

Bird Species

Birds, including raptors, can collide with powerlines, resulting in injury or death (APLIC 2012). Birds that are large-bodied, are fast flyers, have large wing spans, or that have low maneuverability (e.g., many wading birds or waterfowl) or birds that show certain behaviors (e.g., flocking, flying at altitudes at or below powerline height, or birds that nest or forage in close proximity to powerlines) have a higher risk of impacts from powerline collisions (APLIC 2012). Birds generally avoid collision with powerlines when they are perceived by the bird, and therefore collision risk is lower in areas where multiple transmission lines are co-located or transmission lines are placed near other infrastructure (APLIC 2012).

Powerlines can also cause electrocution when a bird is able to touch both energized and grounded electrical components at the same time, which is generally more common in birds with large wing spans, birds that use power poles for their life history activities (e.g., perching, foraging, roosting, or nesting), or in situations where electrical configurations include closely spaced energized and grounded components that area easily spanned by birds (APLIC 2006).

High-voltage lines require spacing between those components that cannot be spanned even by very large birds so that electrocution risk is precluded almost entirely (APLIC 2006). Studies have shown that no waterfowl collisions occurred where distances from powerlines to bird-use areas were more than 1 mile (1.6 kilometers) (APLIC 2012). The two nearest birding hotspots—Goree's Pond (within the Study Area 1.5 miles southeast of the Project Area) and Goldman Dairy Sludge Ponds (0.3 mile south of Study Area) are both associated with human-constructed evaporation ponds (eBird 2021). Each of these hotspots had a high bird diversity, including native and nonnative songbirds, raptors, and waterfowl. However, in most cases, these species were attracted by water and would not reside permanently at or near these ponds owing to lack of habitat required for life history needs, including foraging, breeding, perching, or escaping predation. The existing evaporation ponds would be expected to similarly attract wildlife, particularly birds since they can easily get around fenced components, as would the proposed new evaporation ponds. Monitoring of the existing evaporation ponds has resulted in no observed negative impacts to wildlife. The water contained in the new evaporation ponds would be similar to that of the existing ponds. At the existing ponds, SRP has had no bird deaths. SRP will continue monitoring the existing ponds, will monitor the proposed new ponds, and will take appropriate actions to remain in compliance with the MBTA. New infrastructure associated with the Project may increase the risk of collision. However, these ponds are small and would attract smaller numbers of waterfowl than areas with more water, such as the nearby Picacho Reservoir. Therefore, the increase in collision risk would be relatively small. There is potential for impacts to nests including death or injury of eggs or nestlings or nest failure from construction disturbance.

Potential impacts resulting from behavioral changes arising from increased noise, vibration, or human presence would be the same as those described for terrestrial mammals. Potential impacts from the loss, degradation, and fragmentation of bird habitat from Project activities would be the same as those described for terrestrial mammals.

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Because birds can easily circumvent fencing and may use the evaporation ponds for loafing or resting, negative impacts could occur to birds from water pollutants. However, these impacts would likely be extremely minor as monitoring of the existing evaporation ponds has resulted in no observed negative impacts to wildlife, with no bird deaths. SRP will continue monitoring the existing ponds, will monitor the proposed new ponds, and will take appropriate actions to remain in compliance with the MBTA.

Reptile Species

Potential impacts to reptiles including death, injury, or impacts arising from behavior changes would be similar to those described for terrestrial mammals. Fossorial reptiles, reptiles that are inactive due to heat or cold, and small reptiles would have a higher chance of injury or death compared with those individuals that are more mobile. Potential impacts from the loss, degradation, and fragmentation of reptile habitat from Project activities would be the same as those described for terrestrial mammals.

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Impacts to reptiles would not be expected to arise from water quality within the existing or new evaporation ponds, as these features are fenced and reptiles would not be expected to use these ponds.

Amphibian Species

Potential impacts to amphibians including death, injury, or impacts arising from behavior changes would be similar to those described for terrestrial mammals. Potential impacts from the loss, degradation, and fragmentation of amphibian habitat from Project activities would be the same as those described for terrestrial mammals.

The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Amphibians attracted to the evaporation ponds (existing and new) at the Project may experience death or reduced health from any pollutants that occur there. However, because these ponds are small and localized, impacts would not rise to population-level impacts.

Fish Species

While Project activities could increase the risk of injury or death to any individual fish occurring in the concrete-lined irrigation canals during construction, most or all introduced fish in the canals would likely end up dying in the absence of construction from lack of food, depredation, desiccation, or by being swept into agricultural areas during crop irrigation. The Project would not contribute to the loss of habitat or any population impacts because these sportfish and introduced fish have only been accidentally swept into the canals within the Study Area and would not occur there otherwise. The Project would comply with the air permit issued by the Pinal County Air Quality Control District, which will include provisions to ensure that the Project will not cause or contribute to a violation of the NAAQS, which include protections to minimize damage to animals. Fish would not experience impacts related to water quality in the evaporation ponds because they do not occur there.

Mitigation Measures

The following mitigation measures reduce risk of animal injury or spread of invasive species. For mitigation measures specific to special-status species, please see Exhibit C.

- To minimize risks to birds, the new transmission lines will be constructed following industry-suggested practices aimed at reducing avian collisions and electrocutions (APLIC 2006, 2012). If avian-line interactions become an issue, SRP will move quickly to evaluate the issue and craft a solution using appropriate measures. Therefore, potential impacts to migratory birds and their populations would be minimized.
- Preconstruction surveys for nesting birds will be conducted by qualified biologists if vegetation-clearing activities would occur during bird nesting season (generally March–September and January–June for raptors).
- To minimize the introduction and spread of invasive species and noxious weeds, standard best management practices (BMPs) will be used during construction. These BMPs can include measures such as washing equipment prior to and following mobilization to the Project Area.

Conclusion

Much of the Study Area occurs within previously disturbed areas, developed areas, and active agricultural fields. Existing roads and railroads occur adjacent to and within the Study Area. Existing transmission lines and solar generation facilities occur in the immediate vicinity of the Project. The plant diversity is lower and the structure less complex within the Project Area than in typical undisturbed desert areas. Similarly, fewer wildlife species would be expected to occur in the disturbed, developed, and in-use agricultural areas than would be expected in native desert habitat. However, the irrigation canals likely draw animals from surrounding areas owing to the increase of water or prey species, and some wildlife species are specifically attracted to agricultural fields owing to the open space or higher moisture.

Because the Project would disturb a relatively small area and both native vegetation and agricultural fields occur outside of the Study Area, impacts to general plants and wildlife would be minimal and restricted to individuals. At a landscape level, the Project would not significantly reduce the amount of native desertscrub vegetation available for wildlife use, increase habitat fragmentation, or impact any likely wildlife dispersal or migration corridor. Therefore, the Project may impact individuals (both wildlife and plant) but would be unlikely to have impacts at the population level for any species.

References

Arizona Game and Fish Department (AGFD). 2021a. Arizona Environmental Review Tool Report, Coolidge Expansion Project. Project ID: HGIS: 45983. Accessed November 8, 2021.

———. 2021b. Wildlife Nongame Species, Nongame and Endangered Wildlife Program. Link to species abstracts. Available at: https://www.azgfd.com/Wildlife/NonGameManagement/. Accessed June 2021.

Avian Power Line Interaction Committee (APLIC). 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

———. 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*. Edison Electric Institute and APLIC, Washington, D.C.

Brennan, T.C. 2021. *Reptiles and Amphibians of Arizona*. Available at: http://www.reptilesofaz.org/. Accessed November 2021.

Brennan, T.C. and A.T. Holycross. 2006. *A field guide to amphibians and reptiles in Arizona*. Arizona Game and Fish Department. Phoenix, Arizona.

Brown, D.E. 1994. Biotic Communities: Southwestern United States and Northwestern Mexico. University of Utah Press, Provo, Utah.

Corman, T.E., and C. Wise-Gervais. 2005. *Arizona Breeding Bird Atlas*. Albuquerque: University of New Mexico Press.

Drowley, C. 2021. Birding Picacho Reservoir, Pinal County, Arizona. Maricopa Audubon Society. Available at: https://www.maricopaaudubon.org/birding-picacho-reservoir. Accessed November 2021.

eBird. 2021. eBird species maps. Available at: https://ebird.org/map. Accessed November 2021.

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press and the Arizona Game and Fish Department, Tucson.

iNaturalist. 2021. Sonoran Desert Birds. Available at: https://www.inaturalist.org/guides/669. Accessed November 2021.

Kesner, B.R., and P.C. Marsh. 2010. Central Arizona Project Fish Monitoring: Final Report. Analysis of Fish Population Monitoring Data for Selected Waters of the Gila River Basin, Arizona, for the Five Year Period 2005-2009. Contract No. R09PD32013. Submitted to U.S. Bureau of Reclamation. Tempe, Arizona: Marsh and Associates, LLC.

NatureServe Explorer. 2021. Welcome to NatureServe Explorer. Available at: https://explorer.nature serve.org/. Accessed November 2021.

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EXHIBIT E – SCENIC AREAS, HISTORIC SITES AND STRUCTURES, ARCHAEOLOGICAL SITES

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> *Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon.*

Visual Resources

Overview

This section of Exhibit E addresses the inventory of and potential effects to scenic or visual resources in relation to construction and operation of the Project. The methodology for this assessment is identified below and includes separate discussions associated with scenery (i.e., scenic quality) and sensitive viewers. The methodology is followed by the results of the inventory and the impact assessment, both of which include separate discussions for scenery and sensitive viewers within the context of the Study Area. The Project is located on privately owned land within the City of Coolidge. The Project does not occur on lands managed by the BLM, U.S. Forest Service, or any other agency that requires conformance with visual resource management objectives or guidelines, and does not occur within any designated national or state scenic areas.

Methodology

The purpose of the visual impact assessment is to identify and characterize the level of visual modification in the landscape that would result from the construction and operation of the Project. Modification of the landscape is typically described in terms of the degree of visual contrast, which can potentially affect both scenic quality and sensitive viewers. While scenic quality refers to the general characteristics and inherent aesthetic value of the landscape as a resource regardless of specific viewers, the term sensitive viewers refers to specific viewers and/or groups of viewers whose views could be affected by potential changes to the landscape. The methods used to conduct this visual impact assessment are consistent with past visual resource studies conducted for projects that have been approved by the Siting Committee.

Visual resource information and data for the visual assessment of the Study Area was developed based on research, available geographic information system (GIS) data, aerial photography, and on-site field verification and photographic documentation. These data were collected for all lands, regardless of jurisdiction, and used to develop a comprehensive understanding of the existing landscape and associated visual resources.

Impacts to both scenic quality and sensitive viewers are determined, in part, by evaluating the visual contrast the proposed facilities would have with the existing landscape. Visual contrast refers to the degree that the Project features would either match/repeat existing features in the landscape or contrast with features of the existing landscape. The degree of visual contrast considers the existing landforms, vegetation, and built features present in the landscape and is described in terms or the degree of perceptible change in the basic design elements of form, line, color, and texture that would be evident by the introduction of the Project in the landscape.

The impact thresholds for this assessment are categorized as follows:

High: Project features would result in a strong degree of contrast and would appear as dominant features within the existing landscape.

Moderate: Project features would result in a moderate degree of contrast and would appear as codominant features within the existing landscape.

Low: Project features would result in a weak degree of contrast and would be subordinate to the features of the existing landscape.

SCENERY

In the context of the Project, scenery is a measure of the inherent aesthetic value of the landscape based on the appearance of existing landscape features, including landforms, vegetation, and built features. In general terms, the scenic quality is based on the premise that landscapes with greater diversity and visual variety in landforms and vegetation are more aesthetically pleasing, and therefore hold greater value. For this analysis, impacts to scenic quality were based on comparing the inventoried quality of the scenery (characteristic landscape) to the anticipated quality considering changes in the characteristic landscape as a result of the construction and operation of the Project.

SENSITIVE VIEWERS

The concept of sensitive viewers refers to members of the public that could have potential views of the Project and may be sensitive to potential changes in the scenery that surrounds them. With regard to sensitive viewers, the Project contrast is dependent on several factors, including viewing distance, duration of view, viewing condition, and degree of visibility. When combined, these factors indicate the overall visual dominance of the Project within the landscape. The term "viewing distance" refers to the viewer's physical distance from the Project components and is predicated on the fact that one's ability to discern details dissipates over distance. The duration of view refers to the length of time and associated angle of view that the Project would be visible and is based on the idea that viewer attention is attracted to a higher degree as the duration of view increases. Viewing conditions refer to whether the viewer is looking down at the Project from a superior position, looking up at the Project from an inferior position, or viewing the Project from an elevation that is similar to that of the Project (i.e., a neutral view). The term "degree of visibility" refers to whether views of the Project would be either open and unobstructed or partially to fully obstructed by other features in the existing landscape (i.e., topography, vegetation, or built features). The degree of visibility also refers to whether the Project would be viewed against the sky (i.e., skylined) or viewed against a backdrop of landforms, vegetation, and/or built features.

Anticipated viewer sensitivities to visual changes are also discussed within the analysis, including brief discussions regarding the potential sensitivities of different types of identified viewer groups within the vicinity of the Project. Residential and recreational viewer groups are typically considered to have high sensitivities to visual changes in the landscape, while viewers moving along travel routes are considered to have low to moderate sensitivities to visual changes (unless traveling along a designated scenic travel route or more natural appearing areas).

Inventory Results

SCENERY

The Study Area is located within the Sonoran Basin and Range Level III ecoregion and specifically the Gila/Salt Intermediate Level IV ecoregion (Griffith 2014). The scenery of the Study Area is consistent with rural and agriculture-dominated landscapes in this region of central Arizona. There are flat open fields that are actively being used year-round within the Study Area and open desert beyond the Study Area to the east and panoramic views of the Granite Hills approximately 8 miles to the southeast. The Project is located next to an existing switchyard, generating facility, and associated utility infrastructure. Additionally, existing residential and industrial/manufacturing facilities within the community of Randolph are located near the Project.

The scenic quality within the Study Area can be considered low based on the general lack of visually interesting landforms and vegetation, and the prominence of existing built features and development that contrasts with the appearance of the natural landscape.

SENSITIVE VIEWERS

Residences

A variety of residences are located within the Study Area, including dispersed, farm-based housing and associated out-structures north and south of the Project Area and denser clusters of houses in the community of Randolph immediately to the west of the Project Area. The Arizona Training Program is a long-term care facility located approximately 0.4 mile southwest of the Project.

Recreation Areas

Randolph Park is the nearest existing recreation facility located within the Study Area, approximately 0.10 mile west of the Project. In addition, per the Pinal County Open Spaces and Trails Master Plan, a proposed multi-use trail is planned to parallel UPRR directly adjacent to the Project Site.

Travel Routes

The primary travel routes within the Study Area and in proximity of the Project include SR 287, which runs north–south and is located approximately 0.25 mile west of the Project Site, and Randolph Road, which runs east–west and is located approximately 0.4 mile north of the site. 5th Avenue runs north–south and is located adjacent to the site (within 0.1 mile). Kleck Road, approximately 0.3 mile south of the Project Site, is a local collector road running east–west that services dispersed residences south and southeast of the Project Site. There are numerous local collector streets that are within the community of Randolph that are within 0.25 to 0.4 mile of the Project Area.

Impact Assessment Results

The sections below provide a general description of the potential impacts on scenic quality and sensitive viewers based on the construction and operation of the Project. Overall, impacts associated with the Project would be low to moderate because the Project components would appear similar to the existing electrical generation and transmission infrastructure that occurs adjacent to the Project Area, which is a visually dominant feature in the landscape.

SCENERY

The Project would introduce an approximately 100-acre generation facility and associated infrastructure that includes new evaporation ponds, gas turbines with supporting wet surface air coolers, switchyard infrastructure, and a 500-kilovolt transmission line interconnection. The interconnection consists of A-frame structures and monopoles that are associated with the existing transmission line. The form, line, color, textures, and scale of the Project facilities would be similar in appearance to existing generation facility and transmission line infrastructure as well as industrial facilities within the existing landscape, though the Project facilities would be at a greater density and add cumulatively to the existing industrial infrastructure in the area. The Project is expected to create moderate impacts to the existing, relatively low scenic quality within the Study Area. Project components could be seen and would begin to attract attention though would be similar to or subordinate to other built features within the landscape such as the existing electrical generation and transmission infrastructure, which would result in a moderate degree of contrast, resulting in moderate impacts to scenery. Furthermore, nighttime impacts associated with facility lighting would be minimized by meeting night-sky requirements of the City of Coolidge by implementing directional or fully shielded light fixtures, focusing lighting only on the intended area to avoid light spill and off-site light trespass, and implementing light filters as prescribed to reduce glare and associated skyglow.

SENSITIVE VIEWERS

The following is a summary of anticipated impacts to sensitive viewers resulting from the construction and operation of the Project.

Residences

Although views from residences within the Study Area would vary based on location from unobstructed to partially or fully obstructed, most views of the Project would be partially obstructed by existing features within the landscape, including vegetation, buildings, and other built features, such as the industrial facilities near Randolph Road and SR 287. Based on the generally flat landforms within the Study Area, views from residences would generally be from a neutral viewing position and would include skylined views of the transmission line interconnection and new structures within the existing substation, where visible.

Viewers from the nearest residences would have partially obstructed views of the Project, represented by Key Observation Points (KOPs) 5A and 5C (see Exhibits G-14 and G-15, respectively), approximately 0.10 and 0.07 mile west of the Project, respectively. The form, line, color, texture, and scale of the Project components as viewed from these locations would be similar to those found within the existing visual setting, though views of the Project from KOP 5C would have less screening and more direct views compared with KOP 5A, which has more intervening structures and similar infrastructure when viewed from this location. Despite the relatively close proximity of these residences and the anticipated long duration of view, the Project could be seen but would be seen in the context of other similar existing utility structures and would not attract attention from KOP 5A. Furthermore, the Project components when viewed from KOP 5A would be subordinate to other built features within the landscape such as existing electrical transmission and distribution lines, resulting in a weak degree of contrast and low impacts. Comparatively, Project components when viewed from KOP 5C would appear codominant with existing substation infrastructure, resulting in a moderate degree of contrast and moderate impacts.

Similar to viewers on SR 287, viewers from the Arizona Training Program facility represented by KOP 6 (see Exhibit G-16) would have unobstructed to partially screened views of the Project; however, the Project would be seen in the context of existing utility infrastructure. The form, line, color, texture, and scale of the Project features would be similar to those of the existing transmission line infrastructure in the adjacent switchyard and generation facility and thus would not attract attention, resulting in weak contrast and low impacts.

Recreation Areas

Views from Randolph Park would be unobstructed and from a neutral position. Project features would be skylined but would be seen in the context of the existing switchyard and, while attracting attention, would result in a moderate degree of contrast with moderate impacts to viewers. Similarly, the viewers along the planned multi-use trail would have neutral viewing position with unobstructed views of the Project, but views would be seen in the context of the existing utility infrastructure. While the Project would attract attention, contrast would be moderate, resulting in moderate impacts.

Travel Routes

Views from travel routes within the Study Area would vary based on location from unobstructed to partially or fully obstructed. Most views of the Project would be partially obstructed by existing features within the landscape, such as trees, existing buildings, and other built features. Based on the generally flat landform on which the Project would be located, views of the Project from travel routes would generally be from a neutral viewing position and would include skylined views of the transmission lines and substation infrastructure, where visible.

SR 287 is a north–south-oriented primary travel route within the Study Area located approximately 0.35 mile west of the Project and is represented by KOP 6 for northbound travelers. The form, line, color, texture, and scale of the Project features would be similar to those of the existing transmission line infrastructure in the area. Due to the orientation of travelers along SR 287 in the northbound and southbound directions, the Project would be viewed peripherally and for a short duration of time based on travel speeds. Intervening vegetation, existing transmission line infrastructure, and surrounding residential structures would further influence the viewers' ability to focus on the Project. Additionally, the industrial complex at the intersection of SR 287 and Randolph Road would screen views for travelers near that intersection. The Project could be seen but would not attract attention and would be subordinate to other built features within the landscape, resulting in a weak degree of contrast and low impacts.

Randolph Road is an east–west-oriented primary travel route within the Study Area and is represented by KOP 1 looking southeast and KOP 2 looking southwest across the Project (see Exhibits G-12 and G-13). These KOPs are located approximately 0.6 and 0.35 mile, respectively, away from the Project. Due to the orientation of travelers along Randolph Road in the Study Area, the Project would be viewed peripherally from the westbound and eastbound travel lanes for a short duration of time based on travel speeds. Additionally, the existing transmission line, and industrial and farm infrastructure between the traveler and Project as viewed from KOP 1 would further influence the viewers' ability to focus attention and discern the Project. The Project could be seen but would not attract attention from KOP 1 and would be subordinate to other built features within the landscape as viewed from this KOP, resulting in a weak degree of contrast and low impacts. The addition of the Project as viewed from KOP 2 would have unobstructed views of the Project, which would be skylined, appearing dominant and of greater density along the horizon compared with the existing switchyard and generation facility. Although the Project would be seen in the context of the existing substation and generation facility infrastructure, the Project's dominance, and its prominence due to the lack of intervening existing infrastructure or natural screening, would result in a high degree of contrast and high impacts.

Views from North Vail Road and East Kleck Road, southeast of the Project Site, as represented by KOP 7 (see Exhibit G-17), would have unobstructed views of the Project with skylined views of the generation features and additional switchyard infrastructure. Similar to KOP 2, the addition of Project components when viewed from this KOP would appear dominant and of greater density along the horizon compared with the existing switchyard and generation facility. Although the Project would be seen in the context of the existing substation and generation facility infrastructure, the Project's dominance and prominence would result in a high degree of contrast and high impacts.

Other roads with views of the Project would be from 5th Avenue, Bell Street, and other collector streets within the community of Randolph, which are approximately 0.25 to 0.40 mile from the nearest Project components. KOP 5C is a typical representation of these travel routes, as well as residential views from the community. The form, line, color, texture, and scale of the Project features would be similar to those of the existing transmission line infrastructure in the area and adjacent switchyard and thus would not attract attention, resulting in weak contrast and moderate impacts.

CONCLUSION

Overall, the Project would be similar in form, line, color, texture, and scale compared with other existing transmission line, existing generating facility, and substation infrastructure in the Study Area, though the cumulative increase of infrastructure and facilities with the addition of the Project would result in moderate impacts to scenery. Similarly, impacts to sensitive viewers would range from high to low as a result of viewer perspective, perceived contrast, intervening visual elements such as existing infrastructure and vegetation, and the duration of view of the Project along travel routes within the Study Area. Of the six KOPs analyzed, KOPs 1, 5A, and 6 are expected to have low impacts. Kop 5c is expected to have moderate impacts, and high impacts associated with KOPs 2 and 7 are expected.

Historic Sites and Structures, and Archaeological Sites

As required by the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219, the potential effects of the proposed Project on historic sites and structures and archaeological sites were assessed. The assessment also was prepared to support Arizona Corporation Commission compliance with the State Historic Preservation Act (A.R.S. § 41-861 through § 41-864), which requires state agencies to consider impacts of their programs on historic properties listed in or eligible for listing in the Arizona Register of Historic Places (ARHP), and to provide the State Historic Preservation Office an opportunity to review and comment on the actions that affect such historic properties.

To be eligible for the ARHP, a property must be at least 50 years old (less, if they have special significance) and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They should also possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of the four following criteria:

- Criterion (a): be associated with significant historical events or trends
- Criterion (b): be associated with historically significant persons
- Criterion (c): have distinctive characteristics of a style or a type, or have artistic value, or represent a significant entity whose components may lack individual distinction
- Criterion (d): have yielded or have the potential to yield important information concerning history or prehistory

Methodology

The area studied for the purpose of assessing potential impacts to historic sites and structures, as well as archaeological sites, is a 1-mile-wide buffer from Project Site. SWCA reviewed archival records to identify such properties within the Study Area. Data sources searched include the AZSITE database, the Arizona State Museum (ASM) Archaeological Records Office, the National Register of Historic Places database, and General Land Office plat maps and historic-era topographic maps. The identification effort was supplemented by an in-field cultural resources survey of the Project Site, herein referred to as the Survey Area (Petersen 2021). Correspondence with Native American Tribes is included in Exhibit E-1.

Historic-era Sites

The records review identified no known or potential historic-era sites within the area studied. No historic-era sites were found within the Survey Area.

Historic-era Structures

The records review identified seven known (previously documented) historic-era structures in the area studied, including four in-use roads, one in-use railroad, one in-use overhead utility line, and a series of in-use or recently used irrigation canals identified by previous researchers as cultural resources. One of the historic-era roads, SR 87, has been determined eligible for listing in the ARHP under Criterion (a), for its association with Arizona's historic-era highway system. The other roads include Randolph Road, Kleck Road, and Vail Road, all of which are local section line roads that have been previously considered ineligible for listing in the ARHP. The UPRR (formerly Southern Pacific Railroad Wellton-Phoenix-Eloy Spur) is the historic route of railroad service between Tucson and Phoenix, and has been determined eligible for the ARHP under Criterion (a), for its association within transcontinental railroading in Arizona, 1878–1940. The rails no longer carry passenger trains. Adjacent to the railroad and within the railroad right-of-way (ROW), is a historic-age overhead utility line that likely serves to support UPRR operations. Although previously considered ineligible when evaluated as an individual property for the ARHP, additional research would be needed to evaluate its potential significance as a contributing component of the ARHP-eligible UPRR. A series of 22 historic-age concrete-lined irrigation ditches within and near the historic-era sites and structures study area were assigned a single ASM site number. The irrigation ditches, believed to have been constructed in the mid-twentieth century, were considered ineligible for the ARHP. No historic structures were identified during inspection of the Survey Area.

Archaeological Sites

Four prehistoric archaeological sites have been documented within the Study Area, all of which consist of Hohokam (A.D. 300–A.D. 1450) artifact scatters and two of which also contain artifacts indicative of earlier Archaic period (7500 B.C. –A.D. 300) use. Three of these sites have not been evaluated for their eligibility for listing in the ARHP, and the fourth requires archaeological test excavations to determine its eligibility. No archaeological sites, features, or artifacts were found within the Survey Area.

Assessment of Effects

A project can have direct and/or indirect effects on historic sites and structures and archaeological sites when it alters the characteristics that qualify it for listing in the ARHP. Effects are adverse when they diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property
- Removal of the property from its historic location
- Change of the character of the property's use of physical features within the property's setting that contribute to its historic significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic characteristics
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe
- Transfer, lease, or sale of a property out of government ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance

DIRECT EFFECTS

No ARHP-eligible properties were found during the survey of the Project Site; therefore, no ARHP-eligible properties would be directly affected by the Project.

INDIRECT EFFECTS

Two ARHP-eligible properties eligible under Criterion (a) are outside the area of direct effects. These properties include SR 87 and the UPRR. Construction of the existing plant introduced a new visual element to the area, but did not diminish the integrity of the characteristics of these properties for which they are eligible for the ARHP. The proposed expansion would impose little additional impacts beyond those already imposed on these properties.

Archaeological sites are most commonly eligible for the ARHP under Criterion (d), i.e., for the information held in their archaeological deposits. The four archaeological sites within the area studied are outside the area of direct effects; therefore, no impacts, whether direct or indirect, would be expected to the affect the components of the four archaeological sites for which they may be eligible (i.e., the Project would not negatively affect the archaeological deposits held within the sites).

Conclusion

Based on the foregoing information, the Project is not expected to directly or indirectly result in negative impacts to historic sites, structures, or archaeological sites.

References

Griffith, G.E., Omernik, J.M., Johnson, C.B., and Turner, D.S., 2014, Ecoregions of Arizona (poster): U.S. Geological Survey Open-File Report 2014–1141, with map, scale 1:1,325,000, http://dx.doi.org/10.3133/ofr20141141

Petersen, Eric. 2021. *Cultural Resources Survey of Approximately 93 Acres for the Proposed Coolidge Expansion Certificate of Environmental Compatibility Project, Pinal County, Arizona*. Tucson, Arizona: SWCA Environmental Consultants.

EXHIBIT E-1 – TRIBAL CONSULTATION LETTERS

SRP
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Biological and Cultural Resources | PAB359
P.O. Box 52025
Phoenix, AZ 85072-2025

October 28, 2021

Mr. Robert Miguel
Chairman
Ak-Chin Indian Community
42507 W. Peters & Nall Road
Maricopa, Arizona 85138

RE: Consultation for the Proposed Coolidge Expansion Project

Dear Mr. Miguel,

Salt River Project Agricultural Improvement and Power District (SRP) is proposing construction of the Coolidge Expansion Project (Project), which entails the expansion of and upgrades to the existing Coolidge Generating Station in Coolidge, Pinal County, Arizona. The project area is an approximately 93-acre rectangular area within SRP-owned tax parcel number 401-30-001D, south of the existing Coolidge Generating Station and east of an existing SRP transmission line. The project area is located near the community of Randolph, within the incorporated limits of the City of Coolidge, approximately 4 miles south of Coolidge's historic town center (Figures 1 and 2). The project area is currently used for agricultural purposes.

SRP is seeking a Certificate of Environmental Compatibility (CEC) from the Arizona Corporation Commission (ACC) for this project. Consulting parties for this project include the Arizona State Historic Preservation Office, Ak-Chin Indian Community, Gila River Indian Community, Hopi Tribe, Mescalero Apache Tribe, Pascua Yaqui Tribe, Pueblo of Zuni, Salt River Pima-Maricopa Indian Community, Tohono O'odham Nation, Tonto Apache Tribe, White Mountain Apache Tribe, and Yavapai Apache Nation.

SRP retained SWCA Environmental Consultants (SWCA) to conduct a Class III (i.e., full coverage) cultural resources survey of the project area to identify any cultural resources that are within the project area and that may be directly affected by the Project's construction. No archaeological sites or historic-era buildings or structures were identified within the project area. Additionally, SWCA's study included a records review to identify previous cultural resources studies and known cultural resources that are within 1.0 mile of the project area. Nearby historic-era structures that have been previously considered to be of historical significance include State Route 87 and the Union Pacific Railroad (the former Southern Pacific Railroad Wellton-Phoenix-Eloy Spur). A copy of the report is enclosed for your review and comment. All cultural

1

Exhibit E-1a. Example tribal consultation letter.

resource locational information, including maps, will be redacted from any copies of the document available to the general public.

Please let SRP know if you have any concerns regarding cultural resources as well as any sites of traditional, religious, cultural, or historical importance to your community within the Project vicinity. SRP anticipates filing the CEC Application by December 13, 2021, and would greatly appreciate any comments by November 30, 2021. Please provide comments to my attention, using the details below:

Daniel Garcia
Senior Cultural Resource Management Specialist
SRP Biological and Cultural Resource Services PAB359
P.O. Box 52025, Phoenix, AZ 85072-2025
Dan.Garcia@srpnet.com

Your correspondence will be included as part of the Project record that is filed with the ACC. Additional project information regarding the project is available online at https://srpnet.com/electric/transmission/projects/Coolidge. If you have any further questions or would like to discuss the results of the cultural resources survey, please do not hesitate to contact me by email or by telephone at 602.236.2336.

Cordially,

Daniel Garcia, M.A., RPA
SRP Archaeologist - Senior Cultural Resource Management Specialist

Cc (with enclosures): E. Peters/Ak-Chin Indian Community

2

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Exhibit E-1a. Example tribal consultation letter (continued).

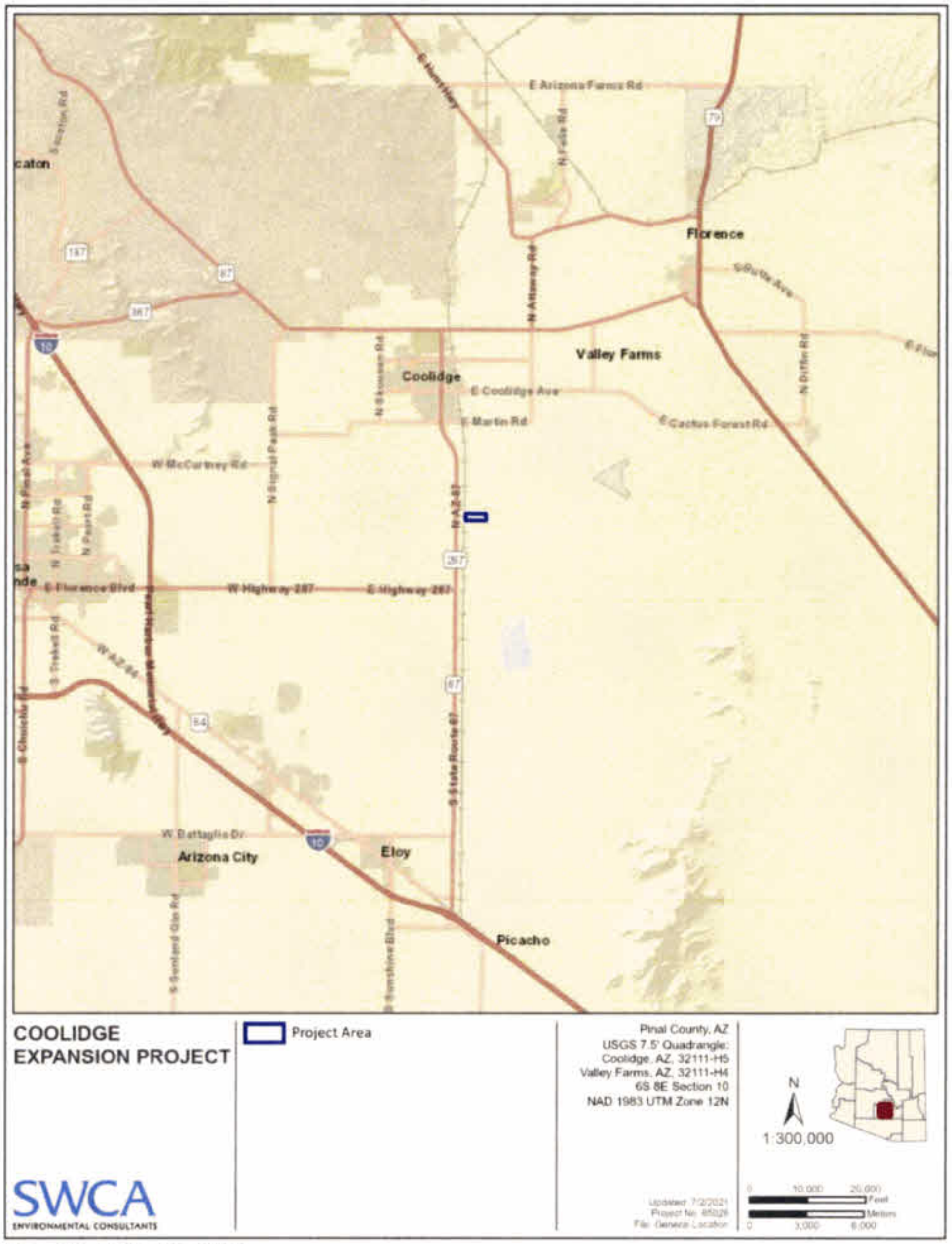

Figure 1. Project location.

3

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Exhibit E-1a. Example tribal consultation letter (continued).

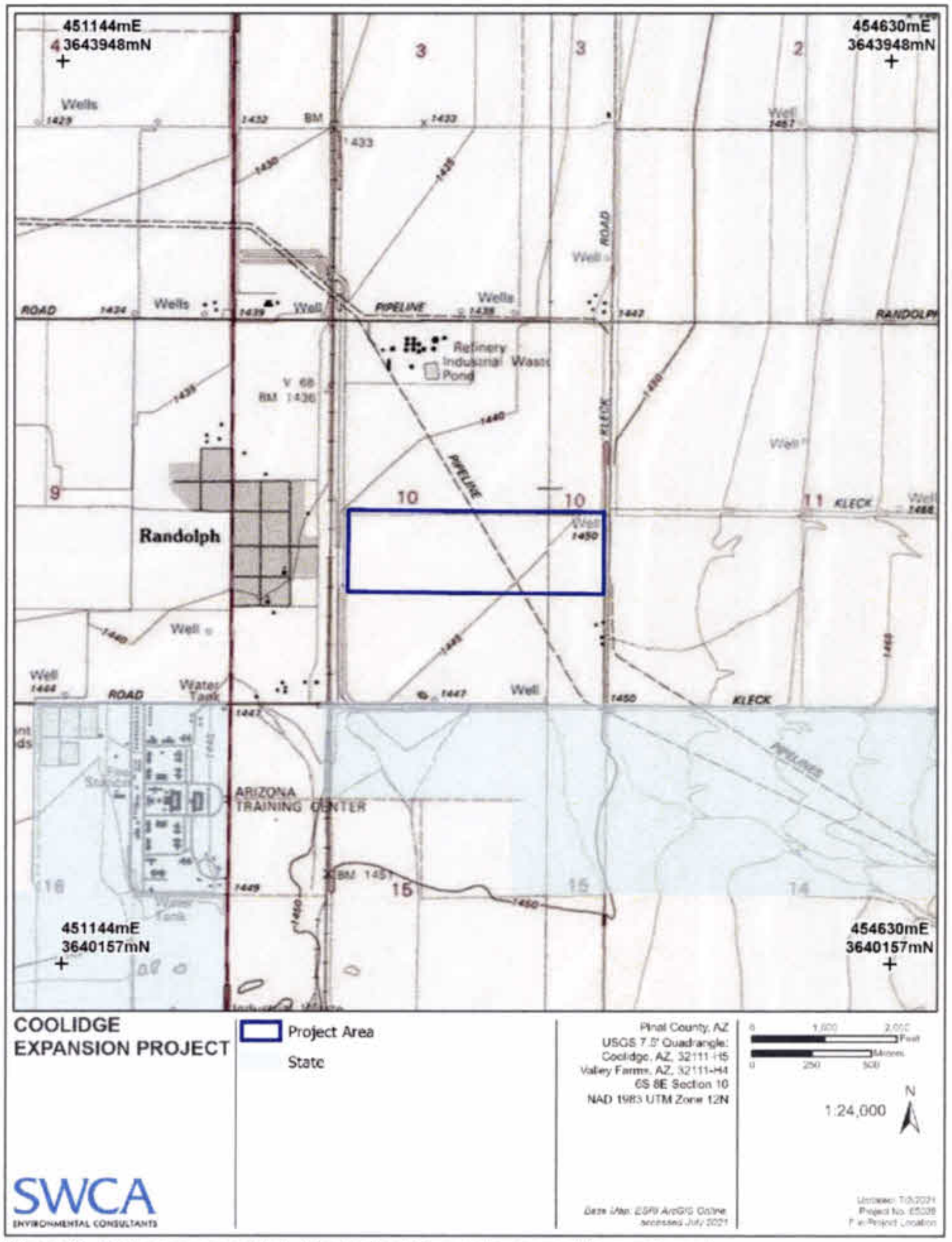

Figure 2. Project area on U.S. Geological Survey topographic quadrangle.

4

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Exhibit E-1a. Example tribal consultation letter (continued).

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Biological and Cultural Resources | PAB359
P.O. Box 52025
Phoenix, AZ 85072-2025

October 28, 2021

Mr. Timothy L. Nuvangyaoma
Chairman
Hopi Tribe
P.O. Box 123
Kykotsmovi, Arizona 86039

RE: Consultation for the Proposed Coolidge Expansion Project

Dear Mr. Nuvangyaoma,

Salt River Project Agricultural Improvement and Power District (SRP) is proposing construction of the Coolidge Expansion Project (Project), which entails the expansion of and upgrades to the existing Coolidge Generating Station in Coolidge, Pinal County, Arizona. The project area is an approximately 93-acre rectangular area within SRP-owned tax parcel number 401-30-001D, south of the existing Coolidge Generating Station and east of an existing SRP transmission line. The project area is located near the community of Randolph, within the incorporated limits of the City of Coolidge, approximately 4 miles south of Coolidge's historic town center (Figures 1 and 2). The project area is currently used for agricultural purposes.

SRP is seeking a Certificate of Environmental Compatibility (CEC) from the Arizona Corporation Commission (ACC) for this project. Consulting parties for this project include the Arizona State Historic Preservation Office, Ak-Chin Indian Community, Gila River Indian Community, Hopi Tribe, Mescalero Apache Tribe, Pascua Yaqui Tribe, Pueblo of Zuni, Salt River Pima-Maricopa Indian Community, Tohono O'odham Nation, Tonto Apache Tribe, White Mountain Apache Tribe, and Yavapai Apache Nation.

SRP retained SWCA Environmental Consultants (SWCA) to conduct a Class III (i.e., full coverage) cultural resources survey of the project area to identify any cultural resources that are within the project area and that may be directly affected by the Project's construction. No archaeological sites or historic-era buildings or structures were identified within the project area. Additionally, SWCA's study included a records review to identify previous cultural resources studies and known cultural resources that are within 1.0 mile of the project area. Nearby historic-era structures that have been previously considered to be of historical significance include State Route 87 and the Union Pacific Railroad (the former Southern Pacific Railroad Wellton-Phoenix-Eloy Spur). A copy of the report is enclosed for your review and comment. All cultural

1

Exhibit E-1b. Hopi Tribe response letter.

resource locational information, including maps, will be redacted from any copies of the document available to the general public.

Please let SRP know if you have any concerns regarding cultural resources as well as any sites of traditional, religious, cultural, or historical importance to your community within the Project vicinity. SRP anticipates filing the CEC Application by December 13, 2021, and would greatly appreciate any comments by November 30, 2021. Please provide comments to my attention, using the details below:

Daniel Garcia
Senior Cultural Resource Management Specialist
SRP Biological and Cultural Resource Services PAB359
P.O. Box 52025, Phoenix, AZ 85072-2025
Dan.Garcia@srpnet.com

Your correspondence will be included as part of the Project record that is filed with the ACC. Additional project information regarding the project is available online at https://srpnet.com/electric/transmission/projects/Coolidge. If you have any further questions or would like to discuss the results of the cultural resources survey, please do not hesitate to contact me by email or by telephone at 602.236.2336.

11-9-21
no cultural resources significant to the Hopi Tribe affected
for Koyiyumptewa

Cordially,

Daniel Garcia, M.A., RPA
SRP Archaeologist - Senior Cultural Resource Management Specialist

Cc (with enclosures): S. Koyiyumptewa/Hopi Tribal Cultural Preservation Office

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Exhibit E-1b. Hopi Tribe response letter (continued).

From: Karl Hoerig <khoerig@pascuayaqui-nsn.gov>
Sent: Monday, November 15, 2021 9:31 AM
To: Garcia Daniel M (Dan) <Dan.Garcia@srpnet.com>
Subject: Coolidge Expansion Project

Dear Mr. Garcia,

Thank you for your letter and accompanying materials requesting consultation in consideration of the planned Coolidge Expansion Project.

The Pascua Yaqui Tribe is not aware of any unidentified heritage resources located within the immediate project area. However, please note that the towns of Coolidge and Eloy are both identified by the Tribe as near-reservation Tribal communities and have significant populations of PYT Tribal members. Based on the late-nineteenth and early-twentieth century presence of an expanding number of Hiaki families in the area, Hiaki (Yaqui) should be included on line 14c of the SHPO Survey Report Summary Form for this project. Furthermore, Hiaki elders have shared traditional knowledge of precolonial (that is, prehistoric and protohistoric) Hiaki communities in the region, including specifically in the vicinity of Toltec near the project area.

Because of the Hiaki families in Eloy and Coolidge, we have concerns that every effort be made to ensure that an expansion of the generation plant not cause additional decrease in the air quality in those communities.

With best regards,
Karl Hoerig

Karl A. Hoerig, Ph.D.
Tribal Historic Preservation Officer
Pascua Yaqui Tribe
7777 S. Camino Huivisim, Building C
Tucson, AZ 85757
(520) 883-5116
karl.hoerig@pascuayaqui-nsn.gov

Exhibit E-1c. Pascua Yaqui Tribe response letter.

From: Garcia Daniel M (Dan) <Dan.Garcia@srpnet.com>
Sent: Monday, November 22, 2021 4:35 PM
To: Karl Hoerig <khoerig@pascuayaqui-nsn.gov>
Cc: Roessel Robert W (Bob) <Bob.Roessel@srpnet.com>
Subject: RE: Coolidge Expansion Project

Dear Dr. Hoerig,

On behalf of Salt River Project, I would like to thank you for your email. We were unaware of Yaqui tribal communities in the vicinity of the Coolidge Expansion Project and appreciate you bringing this to our attention. If you are amenable, I would like to invite you to meet with me and Bob Roessel, SRP Executive Principal for Intergovernmental Relations, to discuss how SRP interacts with Yaqui tribal communities.

With regards to the Class III Cultural Resources report, we will ask our consultant to revise the report and will include updated information about Yaqui presence in the region during the historic era in our upcoming application for a Certificate of Environmental Compatibility (CEC) for the project.

With regards to the impacts of air quality on nearby Tribal communities, please be assured that SRP's intent is to be fully compliant with Pinal County Air Quality standards. A copy of SRP's Title V/Class I Permit Revision Air Quality Application is available for your review on our project website: https://srpnet.com/electric/transmission/projects/Coolidge/pdfx/Air-Permit-Application.pdf. Please

let me know if you have any questions.

Respectfully,

Dan Garcia
Archaeologist - Senior Cultural Resource Management Specialist
SRP | Biological and Cultural Resource Services | PAB359
P.O. Box 52025, Phoenix, AZ 85072-2025
P: (602) 236-2336 | **M**: (480) 213-1177

Exhibit E-1d. SRP response to Pascua Yaqui Tribe response letter.

White Mountain Apache Tribe

Office of Historic Preservation
PO Box 1032
Fort Apache, AZ 85926
Ph: (928) 338-3033 Fax: (928) 338-6055

To: Daniel Garcia, M.A., RPA, SRP Archaeologist Senior Cultural Resource Mngt.

Date: November 17, 2021

Re: *Section 106 Consultation for the Proposed Coolidge Expansion Project*

....

The White Mountain Apache Tribe Historic Preservation Office appreciates receiving information on the project dated: October 28, 2021. In regards to this, please attend to the following statement below.

Thank you for allowing the White Mountain Apache tribe the opportunity to review and respond to the above proposed construction of the Coolidge Expansion Project, which entails the expansion of and upgrades to the existing Coolidge Generating Station in Coolidge, Pinal County, Arizona.

Please be advised, we reviewed the consultation letter and the information provided, and we've determined the project plans will have ***"No Adverse Effected"*** to the tribe's cultural heritage resources and/or traditional cultural properties, and concur with its findings.

Thank you for your continued collaborations in protecting and preserving places of cultural and historical importance.

Sincerely,

Mark T. Altaha

White Mountain Apache Tribe – THPO
Historic Preservation Office

Exhibit E-1e. White Mountain Apache Tribe response letter.

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EXHIBIT F – RECREATIONAL PURPOSES AND ASPECTS

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-Exhibit 1, the intent of this exhibit is to:

> *State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations and attach any plans the applicant may have concerning the development of the recreational aspects of the proposed site or route.*

As part of the land use inventory described under Exhibit A, existing and planned recreation facilities were researched and identified within the Study Area. One existing recreation facility was identified within the Study Area, Randolph Park, a small neighborhood park located within the Community of Randolph, Arizona. Amenities include a basketball court, tot-lot equipment, and picnic tables (Pinal County 2007). No other developed recreation facilities or parks were identified within the Study Area. Recreational opportunities in the Study Area such as equestrian use, walking, or bicycling would occur on public streets or privately owned property. The closest recreation area is Picacho Reservoir, which is approximately 3.3 miles southeast of the Project, outside of the Study Area. Recreation at Picacho Reservoir includes birding, hiking, and off-roading (Maricopa Audubon Society 2021). Additionally, the Casa Grande Ruins National Monument is located approximately 5.8 miles northwest of the Project, outside of the Study Area.

Planned future recreation facilities within the Study Area are managed by Pinal County and include planned trail corridors. As shown in Figure A-4 in Exhibit A, the Pinal County Open Space and Trails Master Plan includes multiple planned multi-use trail corridors within the Study Area, the nearest of which runs parallel along the UPRR (Pinal County 2007).

Based on the distance from the Project to current and planned recreational uses, the Project would have minimal impacts on existing and planned recreational opportunities.

References

Pinal County. 2007. Open Space and Trails Master Plan. Available at: https://www.pinalcountyaz.gov/OpenSpaceTrails/Documents/FINAL%20Open%20Space%20and%20Trails%20Master%20Plan.pdf. Accessed November 2021.

Maricopa Audubon Society. 2021. Birding Picacho Reservoir, Pinal County, Arizona. Available at: https://www.maricopaaudubon.org/birding-picachio-reservoir. Accessed November 2021.

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EXHIBIT G – CONCEPTS OF TYPICAL FACILITIES

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:
Attach any artist's or architect's conception of the proposed plant or transmission line structures and switchyards, which applicant believes may be informative to the committee.

Exhibits G-1 through G-7 demonstrate potential structure types for the proposed 500 kV transmission lines. Exhibit G-8 demonstrates the initial general arrangement of the new 500 kV switchyard in relation to the existing SRP 230 kV Randolph Switchyard. Exhibit G-9 demonstrates the potential future ultimate general arrangement of the new 500 kV switchyard in relation to the existing SRP 230 kV Randolph Switchyard.

Exhibit G-1 – Single Circuit Tubular Type Steel Structures.

Exhibit G-2 – Double Circuit Tubular Type Steel Structure

Exhibit G-3 – Single Circuit Dead-End Tubular Steel Pole Structure

Exhibit G-4 – "Y-Pole" Structure

Exhibit G-5 – "H"-Frame Structure

Exhibit G-6 –Single Circuit Dead-End Two-Pole Tubular Steel Structure

Exhibit G-7 – Single Circuit Dead-End Three-Pole Tubular Steel Structure

Exhibit G-8 – New 500kV Switchyard - Initial General Arrangement

Exhibit G-9 – New 500kV Switchyard – Ultimate General Arrangement

Exhibit G-10 – Typical gas turbine by GE.

Exhibit G-11 – Coolidge Expansion Project components.

Exhibit G-12 – Photosimulation of Project from KOP 1.

Exhibit G-13 – Photosimulation of Project from KOP 2.

Exhibit G-14 – Photosimulation of Project from KOP 5A.

Exhibit G-15 – Photosimulation of Project from KOP 5C.

Exhibit G-16 – Photosimulation of Project from KOP 6.

Exhibit G-17 – Photosimulation of Project from KOP 7.

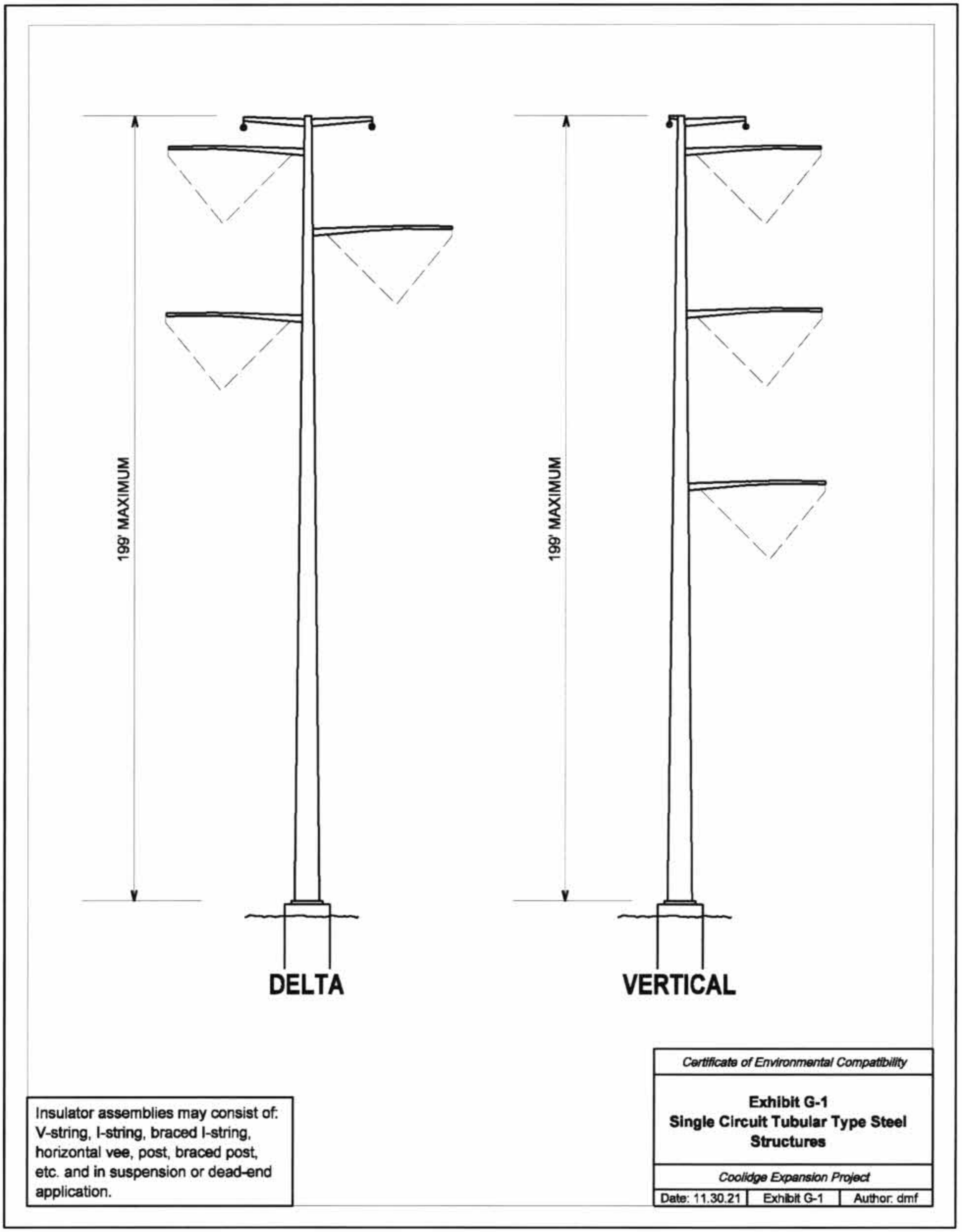
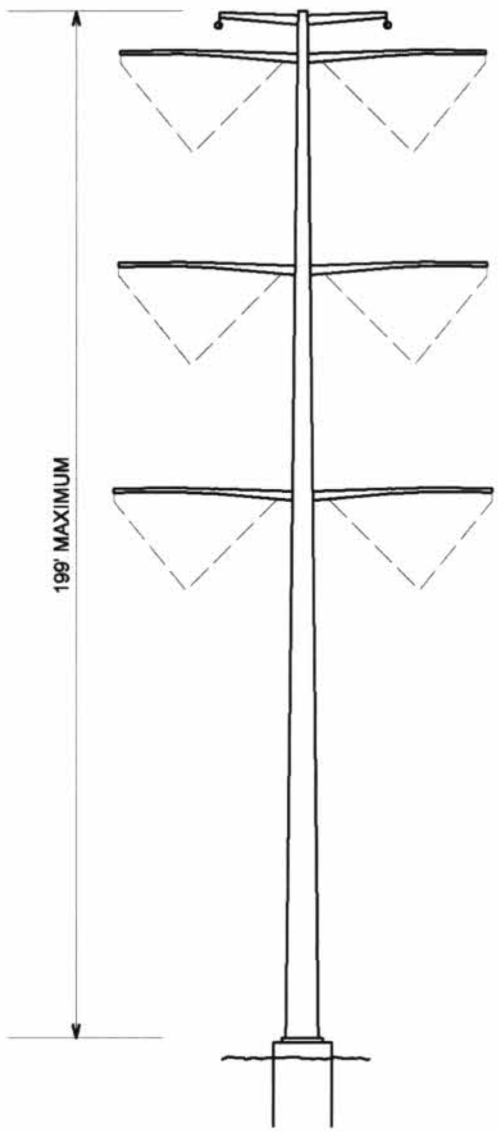


Exhibit G-1. Single Circuit Tubular Type Steel Structures.



Insulator assemblies may consist of: V-string, I-string, braced I-string, horizontal vee, post, braced post, etc. and in suspension or dead-end application.

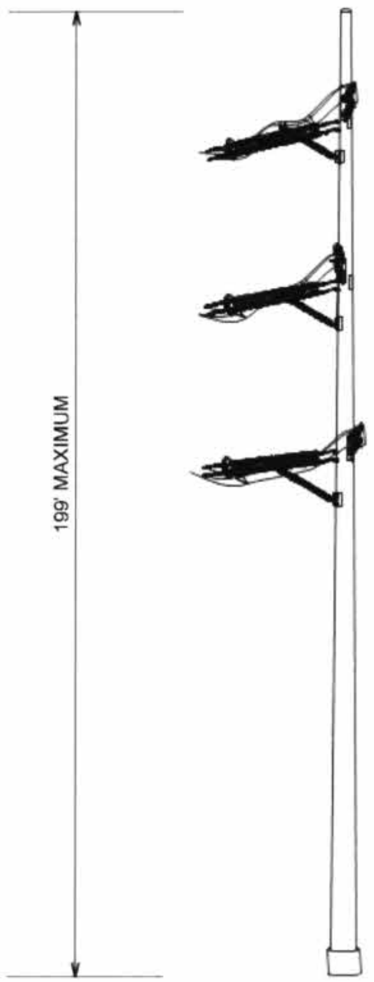
Certificate of Environmental Compatibility

Exhibit G-2
Double Circuit Tubular Type Steel Structure

Coolidge Expansion Project

Date: 11.30.21	Exhibit G-2	Author: dmf

Exhibit G-2. Double Circuit Tubular Type Steel Structure.



Insulator assemblies may consist of: V-string, I-string, braced I-string, horizontal vee, post, braced post, etc. and in suspension or dead-end application.

Structure may be with or without Arms. Shown is without Arms.

Certificate of Environmental Compatibility

Exhibit G-3
Single Circuit Dead-End
Tubular Steel Pole Structure

Coolidge Expansion Project

Date: 11.30.21	Exhibit G-3	Author: dmf

Exhibit G-3. Single Circuit Dead-End Tubular Steel Pole Structure.

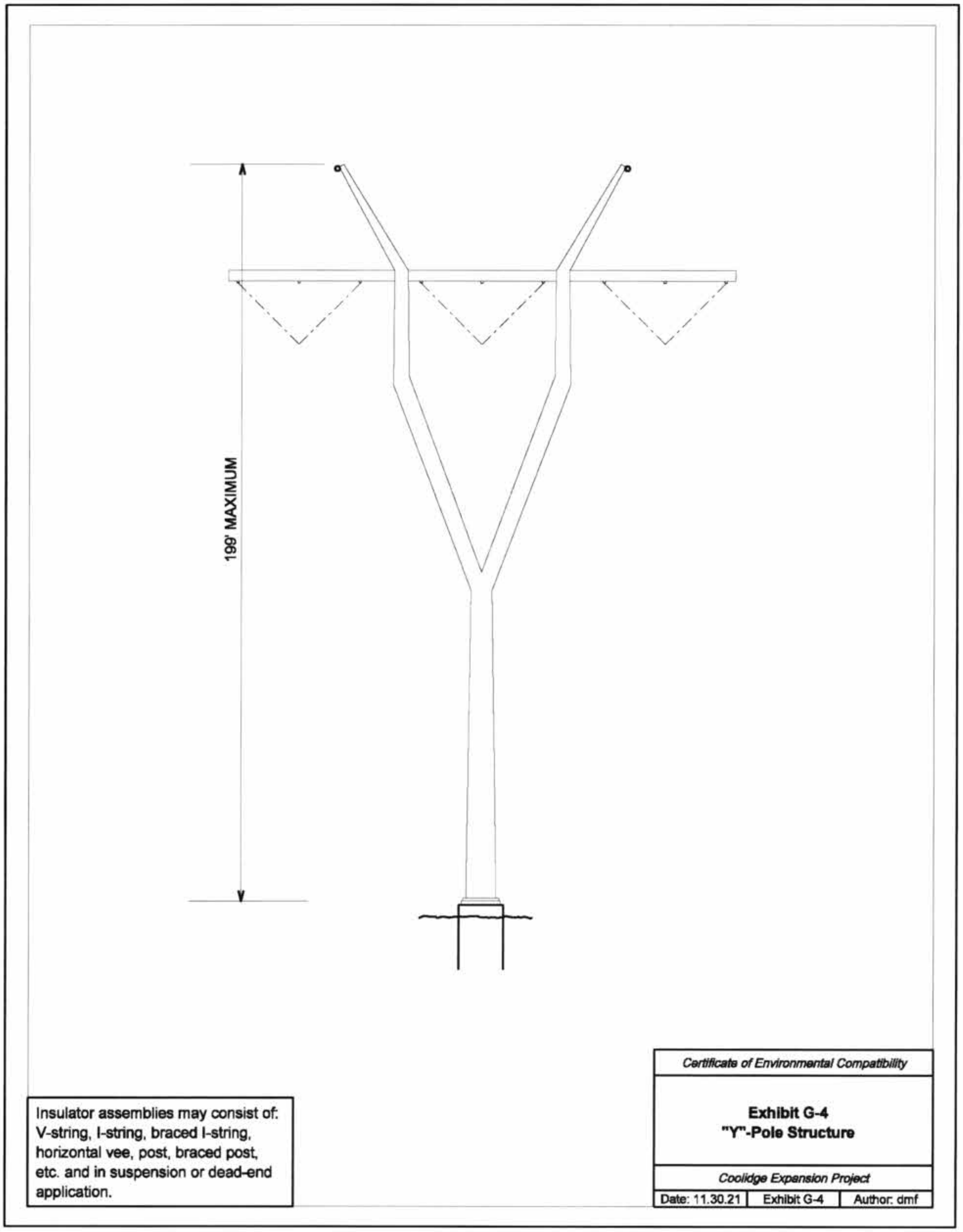


Exhibit G-4. Y-Pole" Structure.

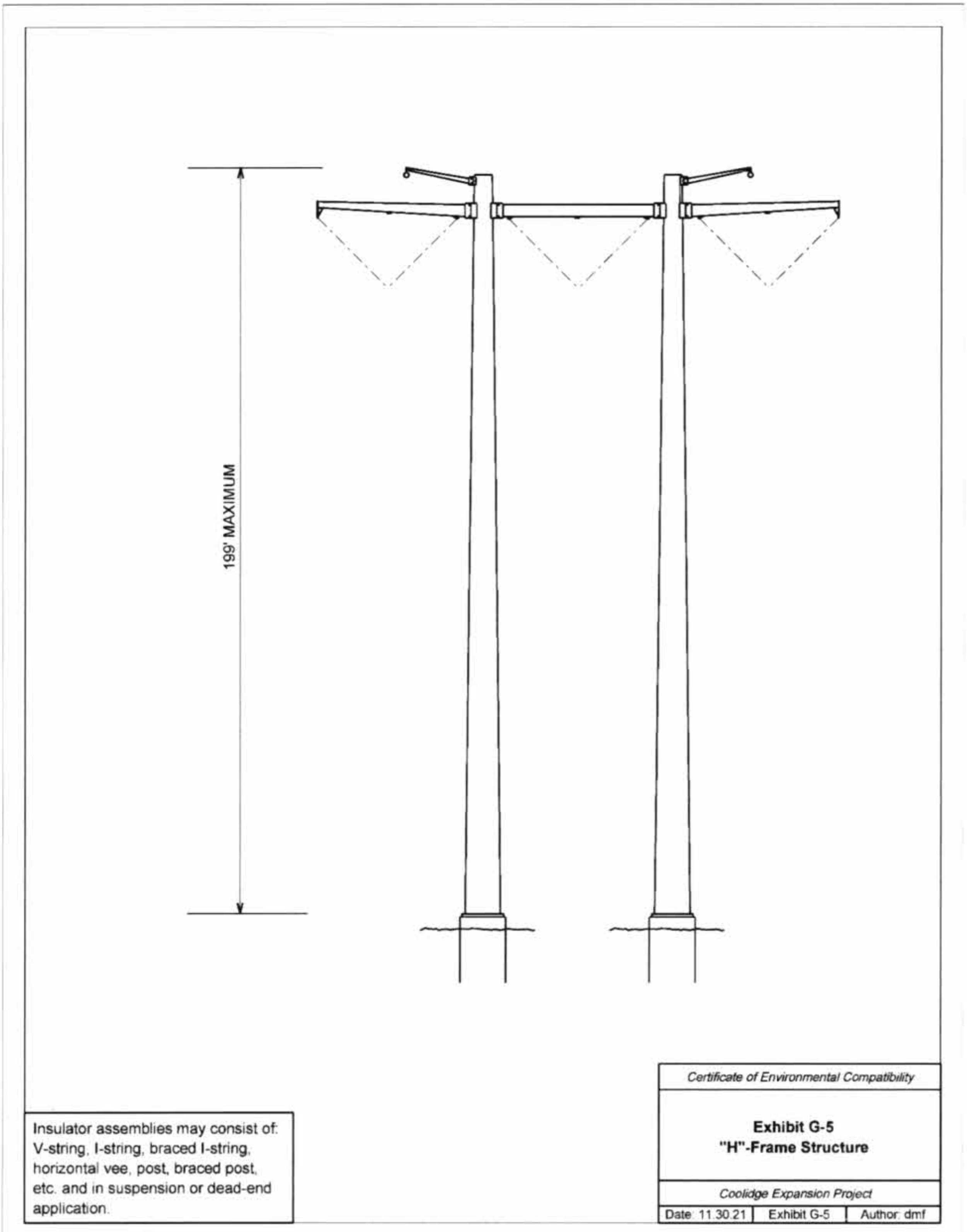
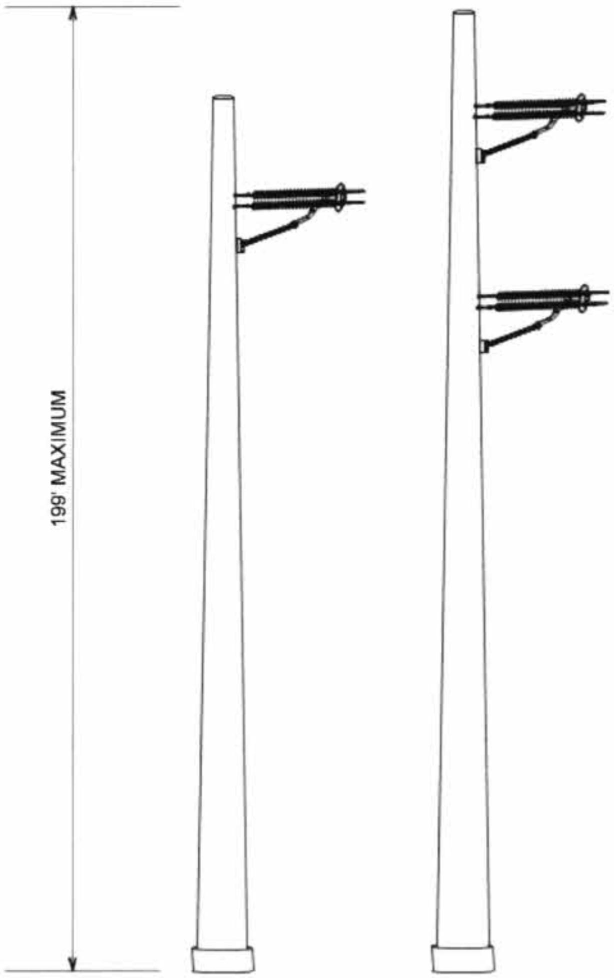


Exhibit G-5. Y-Pole" Structure.



Insulator assemblies may consist of: V-string, I-string, braced I-string, horizontal vee, post, braced post, etc. and in suspension or dead-end application.

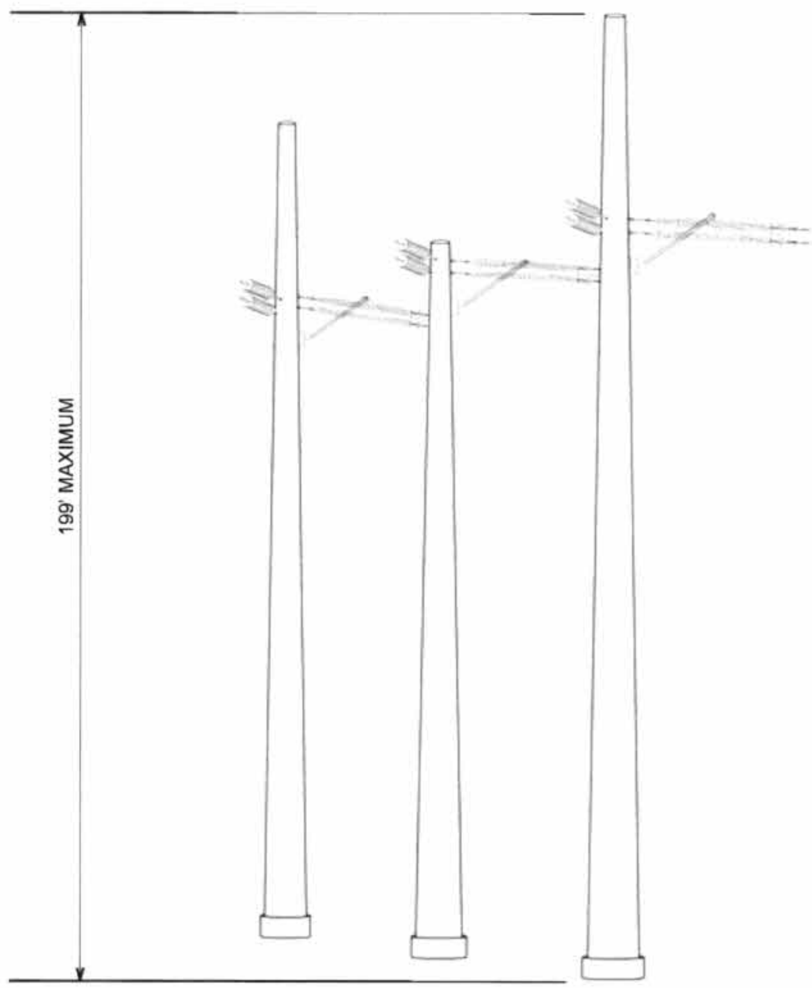
Certificate of Environmental Compatibility

Exhibit G-6
Single Circuit Dead-End
Two-Pole
Tubular Steel Structure

Coolidge Expansion Project

Date: 11.30.21	Exhibit G-6	Author: dmf

Exhibit G-6. Single Circuit Dead-End Two-Pole Tubular Steel Structure



Insulator assemblies may consist of: V-string, I-string, braced I-string, horizontal vee, post, braced post, etc. and in suspension or dead-end application.

Certificate of Environmental Compatibility

Exhibit G-7
Single Circuit Dead-End
Three-Pole
Tubular Steel Structure

Coolidge Expansion Project

Date: 11.30.21	Exhibit G-7	Author: dmf

Exhibit G-7. Single Circuit Dead-End Three-Pole Tubular Steel Structure

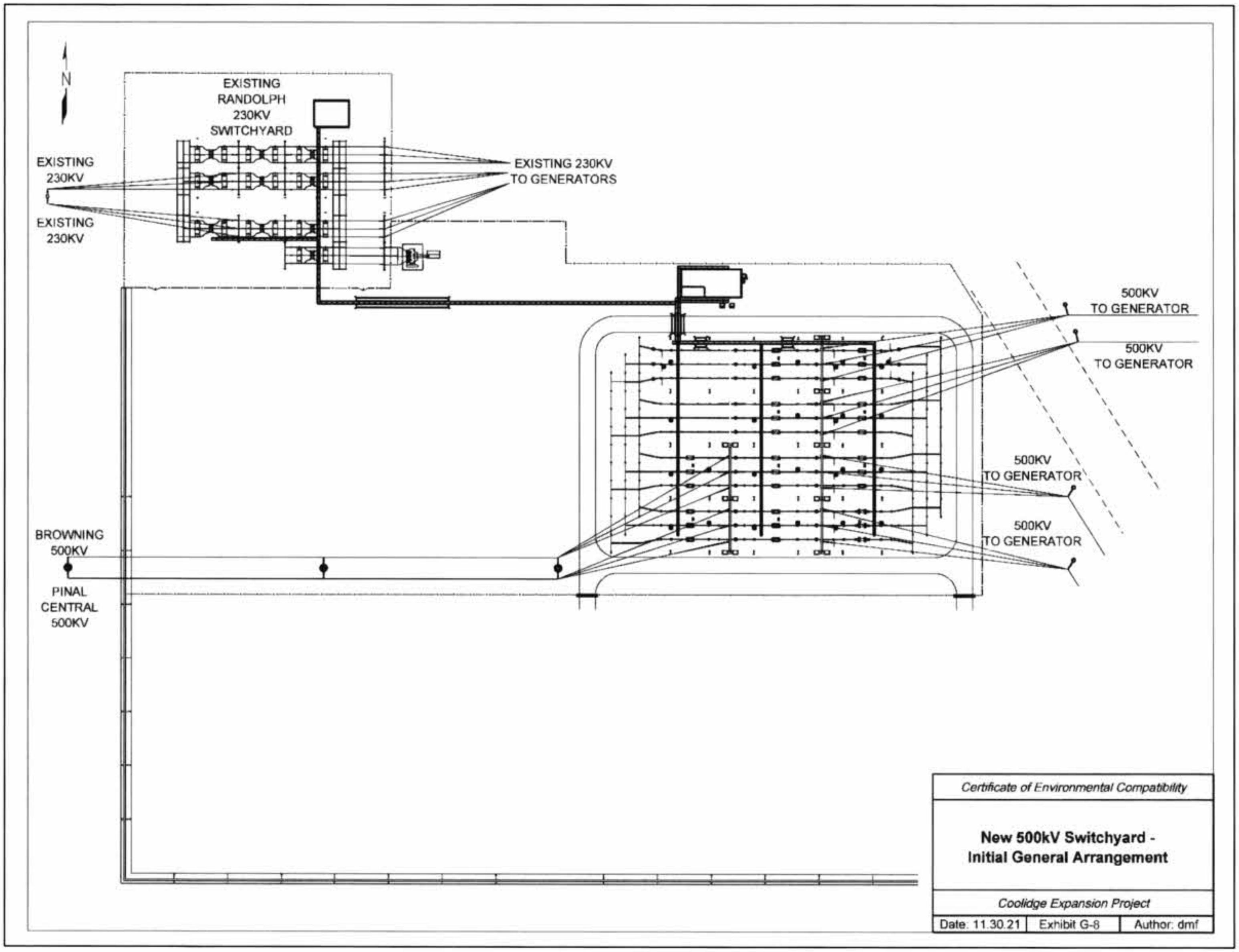


Exhibit G-8. New 500kV Switchyard - Initial General Arrangement

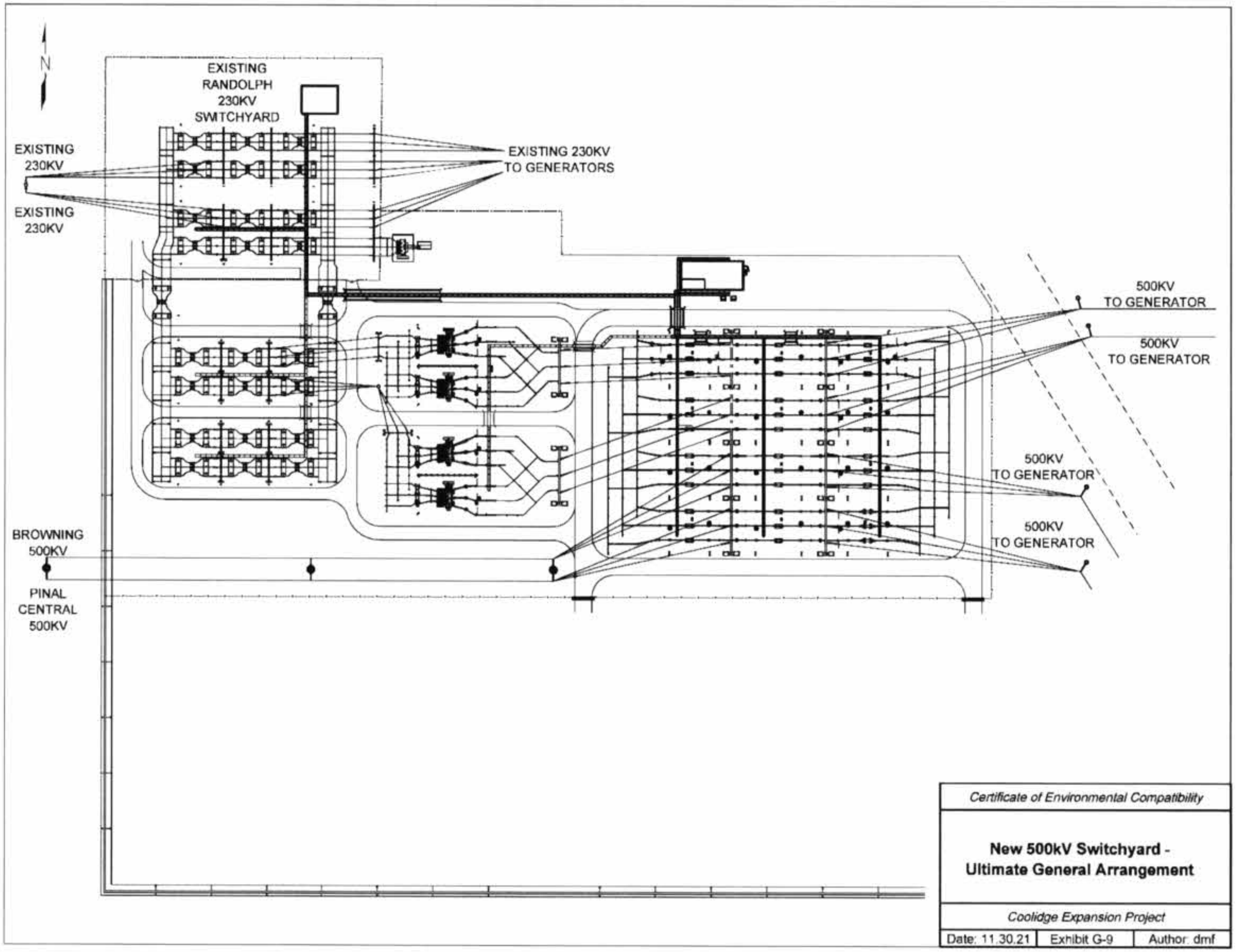


Exhibit G-9. New 500kV Switchyard – Ultimate General Arrangement

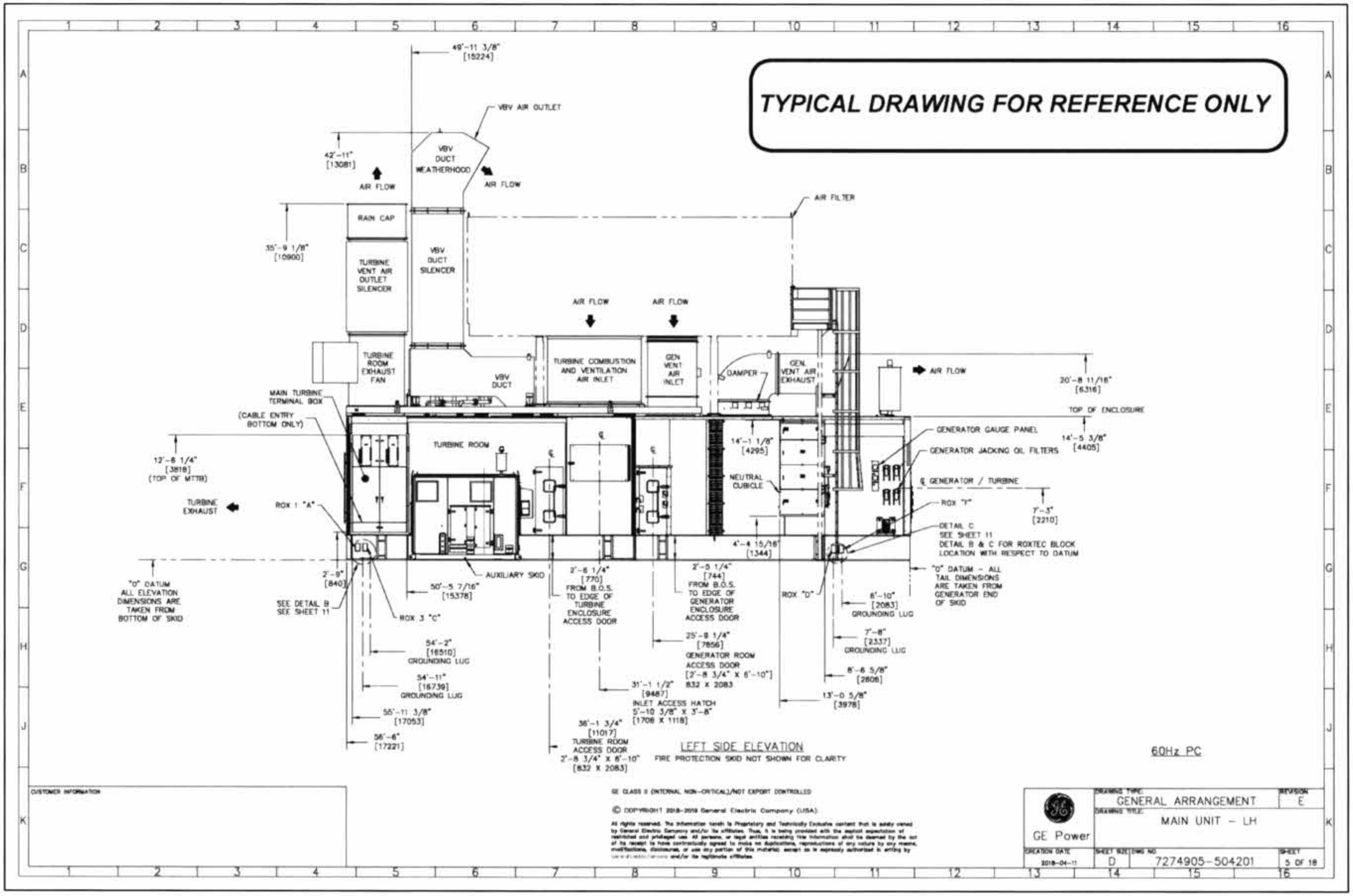


Exhibit G-10. Typical gas turbine.

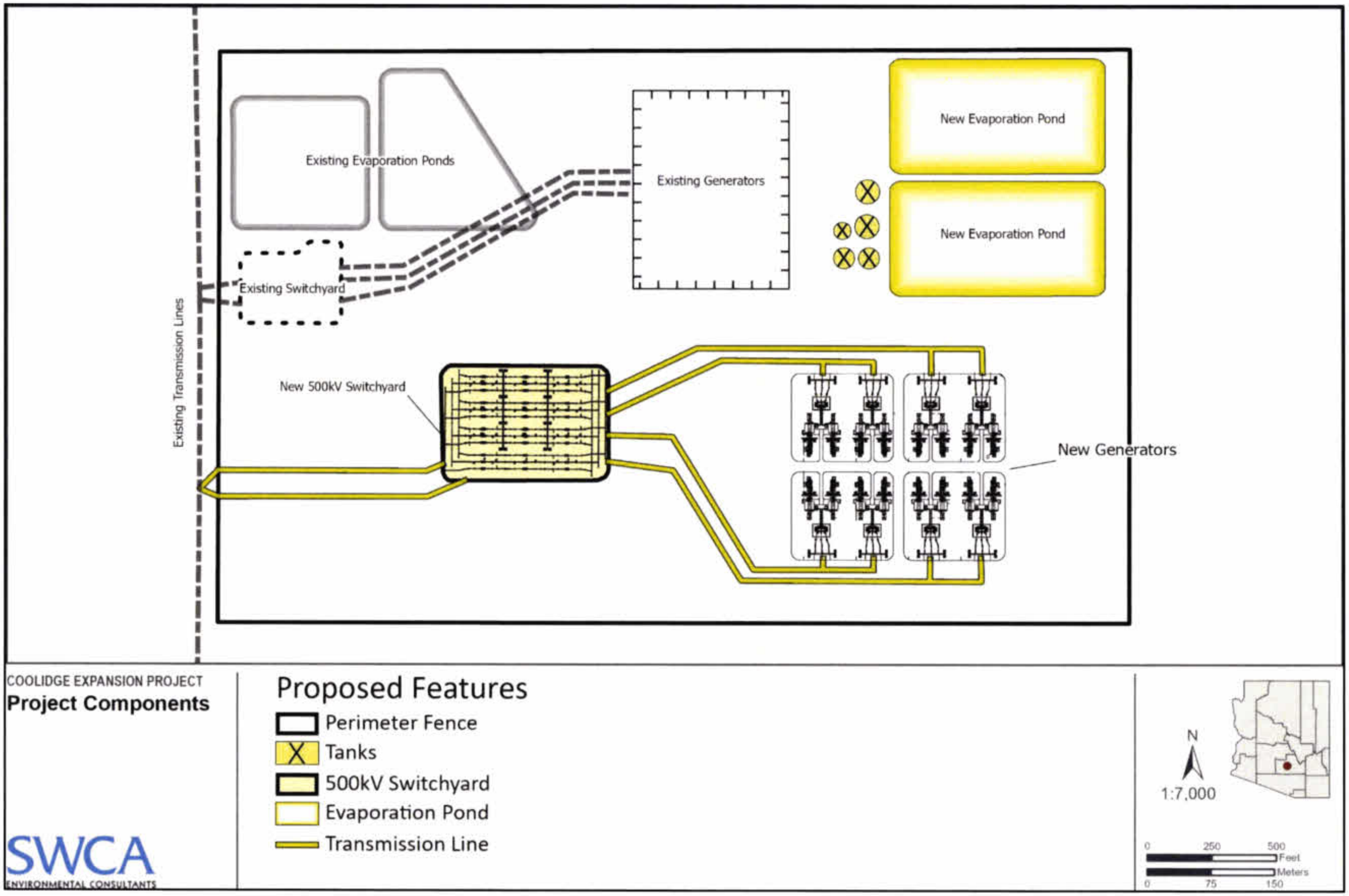


Exhibit G-11. Coolidge Expansion Project components.

Existing Condition

KOP 1: View from Randolph Road and 5th Avenue looking southeast

Simulated Condition

KOP 1: View from Randolph Road and 5th Avenue looking southeast

Viewing Location

General Arrangement

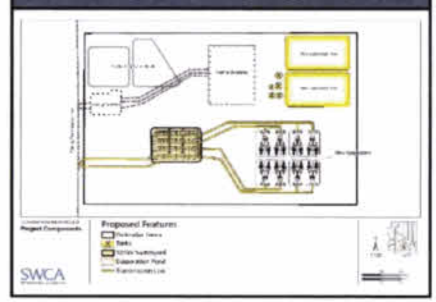


Photo Date and Time: August 24, 2021, 9:00 am

View Location: Approximate distance to nearest new structure from photo location is 0.5 miles.

Simulations were prepared using information provided by SRP. Structure locations, colors, and heights may be different based on final engineering and design.

Coolidge Expansion Project | October 2021
Simulation from KOP 1: View from Randolph Road and 5th Avenue

Exhibit G-12. Photosimulation of Project from KOP 1.

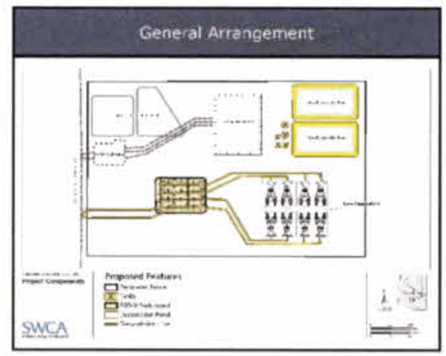


Photo Date and Time: November 2, 2021, 11:05 am

View Location: Approximate distance to nearest new structure from photo location is 0.5 miles.

Simulations were prepared using information provided by SRP. Structure locations, colors, and heights may be different based on final engineering and design.

Coolidge Expansion Project | December 2021
Simulation from KOP 2: View from intersection of Randolph Road and North Vail Road

Exhibit G-13. Photosimulation of Project from KOP 2.

Existing Condition KOP 5A: View from residence at East Malcom X Street and North Kennedy Street looking east

Simulated Condition KOP 5A: View from residence at East Malcom X Street and North Kennedy Street looking east

Viewing Location

General Arrangement

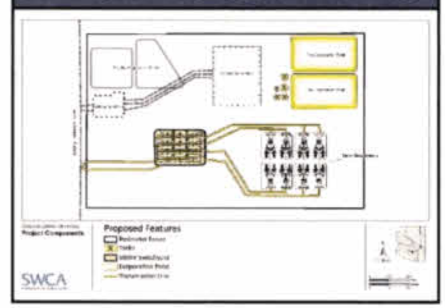


Photo Date and Time: August 24, 2021, 10:00 am

View Location: Approximate distance to nearest new structure from photo location is 0.15 miles.

Simulations were prepared using information provided by SRP. Structure locations, colors, and heights may be different based on final engineering and design.

Coolidge Expansion Project | October 2021
Simulation from KOP 5A: View from residence at East Malcom X Street and North Kennedy Street

Exhibit G-14. Photosimulation of Project from KOP 5A.

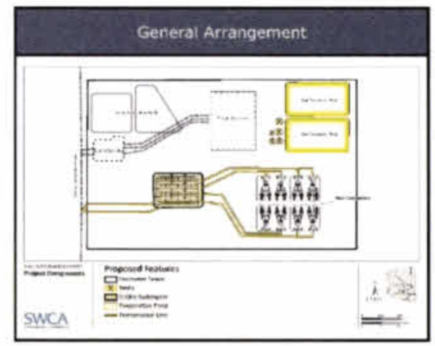


Photo Date and Time: August 24, 2021, 10:10 am

View Location: Approximate distance to nearest new structure from photo location is 0.1 miles.

Simulations were prepared using information provided by SRP. Structure locations, colors, and heights may be different based on final engineering and design.

Coolidge Expansion Project | October 2021
Simulation from KOP 5C: View from residence at East Malcom X Street and North Hughes Street

Exhibit G-15. Photosimulation of Project from KOP 5C.

Existing Condition KOP 6: View from residence at South Arizona Boulevard and East Kleck Road looking northeast

Simulated Condition KOP 6: View from residence at South Arizona Boulevard and East Kleck Road looking northeast

Viewing Location

General Arrangement

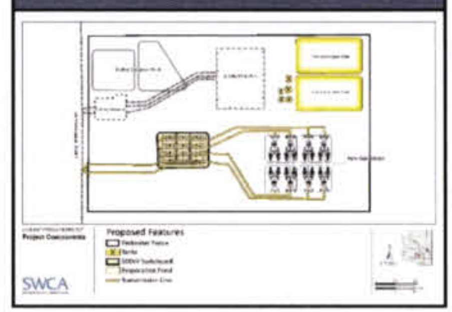


Photo Date and Time: August 24, 2021, 9:50 am

View Location: Approximate distance to nearest new structure from photo location is 0.4 miles.

Simulations were prepared using information provided by SRP. Structure locations, colors, and heights may be different based on final engineering and design.

Coolidge Expansion Project | October 2021
Simulation from KOP 6: View from residence at South Arizona Bouleveard and East Kleck Road

Exhibit G-16. Photosimulation of Project from´KOP 6.

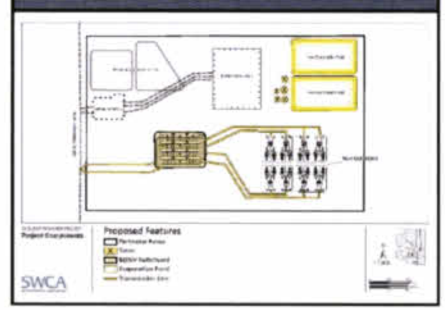


Photo Date and Time: August 24, 2021, 9:40 am

View Location: Approximate distance to nearest new structure from photo location is 0.3 miles.

Simulations were prepared using information provided by SRP. Structure locations, colors, and heights may be different based on final engineering and design.

SWCA ENVIRONMENTAL CONSULTANTS

Coolidge Expansion Project | October 2021
Simulation from KOP 7: View from North Vail Road and East Kleck Road

Exhibit G-17. Photosimulation of Project from KOP 7.

EXHIBIT H – EXISTING PLANS

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:
To the extent applicant is able to determine, state the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route.

Land uses are discussed in Exhibit A and shown in Figures A-3 and A-4 of that exhibit. As part of the land use study, the *City of Coolidge 2025 General Plan* and the Pinal County Comprehensive Plan were evaluated, and identified land uses and development plans were reviewed and verified with the City of Coolidge and the Pinal County Planning and Development Departments. Representatives from the City of Coolidge and Pinal County were also invited to participate in the Project public involvement efforts to ensure consistency with plans and to identify potential issues throughout the environmental and public planning and outreach process.

In October 2021, the Applicant mailed letters to the entities listed in Table H-1 to provide Project information and to request new or additional information on plans or planned developments. Exhibit H-1 provides an example copy of the letter and accompanying map. To date, no specific responses to this mailing have been received.

Table H-1. Entities that Received Letters with Project Information

Contact Name	Title	Agency/Organization
Roderick Lane	Southcentral District Engineer	Arizona Department of Transportation
Jason Spitzkoff	Manager, Transmission & Distribution Engineering	Arizona Public Service Company
Ruben Ojeda	Manager, Right-of-Way Section	Arizona State Land Department
Ed Kender	Field Manager	Bureau of Land Management, Lower Sonoran Field Office
Amelia Taylor	Field Manager	Bureau of Land Management, Tucson Field Office
Jessica Herndon-Ladewig	Realty Specialist, Phoenix Area Office	Bureau of Reclamation
Rick Miller	City Manager	City of Coolidge
Tim Hansen	GIS Coordinator	City of Coolidge Development Services
Gilbert Lopez	City of Coolidge Development Services Director	City of Coolidge Development Services
James Myers	Coolidge Municipal Airport Manager	Coolidge Municipal Airport
Ken Robbins		Electrical District No. 2
Sidney Smith	District General Manager	Hohokam Irrigation & Drainage District
Leo Lew	County Manager	Pinal County
Lester Chow	Pinal County Community Development Director	Pinal County Community Development
Brandi Ogle	Business Manager	San Carlos Irrigation Drainage District
Kyle Varvel	Acting Irrigation Manager	San Carlos Irrigation Project
Arthur Johnson	Acting Power Manager	San Carlos Irrigation Project
Ferris Begay	Project Manager	San Carlos Irrigation Project
Craig Miller	Assistant Director Property Tax	UPRR

Contact Name	Title	Agency/Organization
		Saint Holdings, LLC / Pinal Land Holdings, LLC
		Evergreen Development Services
		Walton International Group

Local Government Plans

City of Coolidge

The City of Coolidge completed a rezoning of approximately 454 acres that includes the Project Site from Agricultural (AG) to General Industrial (I-2) in June 2008. The City plans to encourage the development of this zoned area as industrial/commercial park.

In addition, the current 2025 General Plan for the City of Coolidge identifies the Project Site as Industrial, which would allow for the Project's proposed use on the Project Site. The Project is consistent with the City of Coolidge prescribed zoning and land use plans.

Pinal County

Pinal County has jurisdiction over those lands closest to the Project Site that are not within the City of Coolidge. The closest of those lands are to the west of the Project Site where agricultural uses, a transportation and utility corridor, and the community of Randolph are located.

As described in Exhibit A, the Project is consistent with the land use designations in the Pinal County Comprehensive Plan.

State Government Plans

The State of Arizona is considering a proposed north-south freeway connecting U.S. 60 to I-10 near Picacho, Arizona. This highway, if built, would be east of Coolidge and would not be affected by the Project. There are no other identified plans by State of Arizona agencies for lands within the Project Area.

Private Entity Plans

Planned Area Developments

Information regarding Planned Area Developments (PAD) within the Project Study Area was requested from the City of Coolidge and Pinal County. All identified PADs in the Study Area are administered exclusively by the City of Coolidge. Figure A-4 in Exhibit A shows the identified PADs in various stages of the permitting and entitlement process; however, none of the PADs are actively being developed. There are currently five PADs within the Project Area, depicted on Figure A-4: Brighton Village, Sunshine Farms, the Estates, Sontesta, and Westcor. None of these PADs are currently active.

Other Developments

Other future development plans include a waste processing plant development adjacent to the Project Site. True North Renewable Energy submitted an application in October 2020 for a conditional use permit for an Organic Waste Processing Plant on approximately 81 acres in the General Industrial (I-2) zoning district located at 820 East Kleck Road, within the parcel located immediately south of the Project Area (APN 401-30-001K).

Conclusion

The Project would be consistent with the existing plans of the state, local government, and private entities for other developments within the Project Area.

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EXHIBIT H-1 – EXAMPLE LETTER AND MAP

Delivering water and power®

Regulatory policy & Strategic Engagement
PAB 4TB | P.O. Box 52025
Phoenix, AZ 85072-2025
P: (602) 236-2326
David.felix@srpnet.com

October 29, 2021

Roderick Lane
South Central District Engineer
Arizona Department Of Transportation
1221 S Second Ave
Tucson, AZ 85713

Re: Salt River Project Agricultural Improvement and Power District's Proposed Coolidge Expansion Project

Mr. Roderick Lane,

Salt River Project Agricultural Improvement and Power District (SRP) plans to file an application for a Certificate of Environmental Compatibility (CEC) for the Coolidge Expansion Project (Project or CEP) with the Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) in December 2021. The CEP involves the expansion of the Coolidge Generating Station, a natural gas power plant located in Coolidge, Arizona, that was built between 2009 and 2011 and purchased by SRP in 2019.

Once operational, the CEP will allow SRP to meet the significant near-term increase in energy needs in its service territory and will enable the addition of more renewable resources (such as solar and wind) while maintaining a reliable power grid. The CEP will entail the construction and operation of 16 gas turbines and associated transmission infrastructure to produce up to 820 megawatts (MW) of electrical power and deliver it to the grid through a new 500 kilovolt (kV) switchyard to be connected to the 500kV circuit on the existing Pinal Central to Browning transmission line (see attached map illustrating the Project location and 2-mile study area).

SRP and its consultant, SWCA Environmental Consultants (SWCA), are completing environmental studies to evaluate the project, the results of which will be documented in an application for a CEC and will be brought before the Siting Committee. SRP will request Siting Committee approval for a CEC for the Project.

Arizona Administrative Code Rule R14-3-219 directs an applicant to include in its CEC application an Exhibit H addressing the following: "To the extent the applicant is able to determine, state the existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site or route."

This letter is an opportunity for your organization to provide any information or comments regarding development plans in the vicinity of the Project, specifically those within the 2-mile Project study area (see attached map), for inclusion in the CEC application. We respectfully request your response in writing; specifically, please advise us of any relevant existing or future development plans that you can identify at this time.

To allow your information to be included in the CEC application, please forward it to me by November 11, 2021, via email at david.felix@srpnet.com, or by physical mail: Attn: David Felix, SRP, PAB 4TB - P.O. Box 52025, Phoenix, AZ 85072-2025.

Thank you for your cooperation.

Respectfully,

David Felix
Manager
SRP | Regulatory Policy & Strategic Engagement
P: (602) 236-2326 | **M**: (602) 540-7522

Cc: Michele Maser, SRP; Devin Petry, SWCA

SRP
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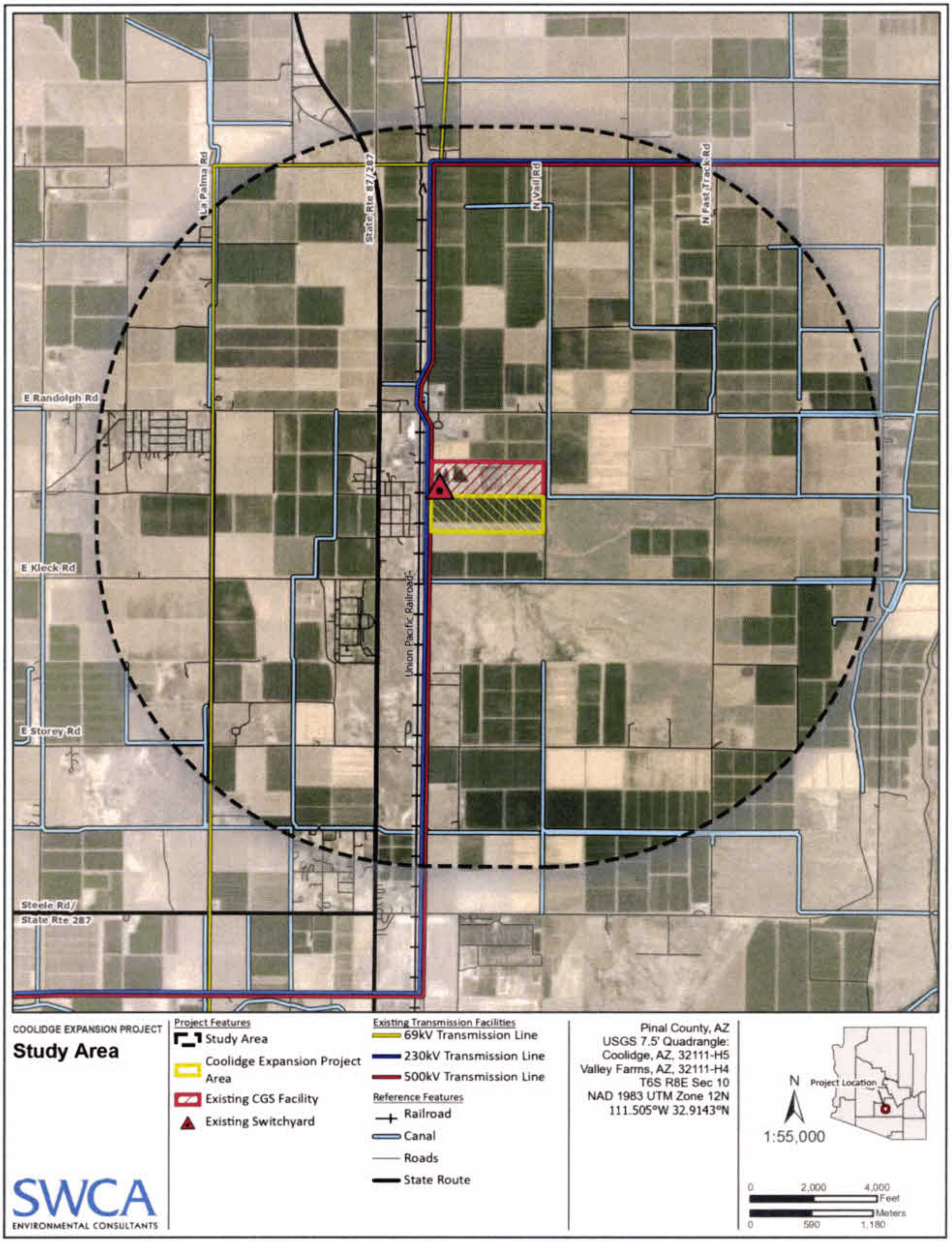
La Palma Rd
State Rte 87/287
N Vail Rd
N Fast Track Rd
E Randolph Rd
E Kleck Rd
Union Pacific Railroad
E Storey Rd
Steele Rd/
State Rte 287
COOLIDGE EXPANSION PROJECT
Study Area
Project Features
Study Area
Coolidge Expansion Project Area
Existing CGS Facility
Existing Switchyard
Existing Transmission Facilities
69kV Transmission Line
230kV Transmission Line
500kV Transmission Line
Reference Features
Railroad
Canal
Roads
State Route
Pinal County, AZ
USGS 7.5' Quadrangle:
Coolidge, AZ, 32111-H5
Valley Farms, AZ, 32111-H4
T6S R8E Sec 10
NAD 1983 UTM Zone 12N
111.505°W 32.9143°N
N
Project Location
1:55,000
0 2,000 4,000 Feet
0 590 1,180 Meters
SWCA
ENVIRONMENTAL CONSULTANTS

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EXHIBIT I – ANTICIPATED NOISE/INTERFERENCE WITH COMMUNICATION SIGNALS

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219: Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities.

Introduction

A noise study was conducted to determine the potential noise impacts that would result from construction and operation of the proposed Project. The study involved conducting a noise survey to determine the current ambient noise levels. Noise due to construction and operation of Project was then modeled to determine additional noise impacts.

This exhibit provides background information on environmental sound, including descriptions of the sound metrics used throughout the report; applicable noise standards and regulations; the results of the ambient sound measurement program; and an assessment of the potential noise impacts from development and operation. Interference with communication signals is also evaluated.

Existing Sound Levels

The ambient noise in the vicinity of the Project Site is dominated by trains on the railroad located between the west edge of the Project and the community of Randolph, traffic noise from SR 87, existing industrial uses in the immediate vicinity, the existing Coolidge Generating Station, and agricultural activities on the Project Site and surrounding agricultural lands. To determine reasonable estimates for the existing noise levels in the vicinity of the Project, noise monitoring was conducted at locations in the surrounding area.

Ambient sound measurements were conducted from August 11 through August 13, 2021, to determine the existing soundscape in the vicinity of the Project, including the existing Coolidge Generating Station. All the sound measurements were collected using three Larson Davis Model 831c precision integrating sound-level meters that meet the ANSI Standards for Type 1 precision instrumentation at two long-term monitoring sites and nine short-term monitoring sites. During the measurement program, microphones were fitted with windscreens, and set upon a tripod approximately 5 feet above ground and located out of the influence of any reflecting surfaces. The sound analyzer was calibrated at the beginning and end of the measurement period. The sound level meters were programmed to sample and store A-weighted (dBA) and octave band-specific sound level data, including Equivalent Sound Level (L_{eq}) and Day-Night Average Sound Level (L_{dn}) sound levels.[5,6]

Results of the ambient sound survey indicate that daytime L_{eq} sound levels at the measurement locations ranged from 48.2 dBA in proximity to the west edge of the Project and 51.5 dBA at the east edge of the Project. The complete noise technical report for the Project, titled *Noise Technical Report for the Coolidge Expansion Project* and dated November 2021, is included as Exhibit I-1. Please refer to Exhibit I-1 for a complete list of all monitoring results at the short-term and long-term monitoring sites.

[5] The Leq is defined as the single sound pressure level that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.

[6] The Ldn represents a 24-hour A-weighted sound level average where sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting.

Noise Impacts from Proposed Project

Noise levels resulting from construction and operation of the Project were evaluated with respect to noise guidelines and policies as established by Pinal County, Arizona, and Federal agencies. No federal laws, regulations, or standards that directly affect this Project with respect to noise were identified. However, there are guidelines at the federal level that direct the consideration of a broad range of noise issues. For example, the U.S. Environmental Protection Agency (EPA) has published a guideline that specifically addresses issues of community noise (EPA 1974). This guideline, commonly referred to as the "levels document," recommends a threshold for noise levels affecting residential land use of L_{dn} <55 dBA for exterior levels. Additionally, the Department of Housing and Urban Development's *Noise Guidebook,* Chapter 2, Section 51.101(a)(8), proposes that exterior areas of frequent human use follow the EPA's 55 L_{dn} threshold. However, the same Section indicates that a noise level of 65 dBA L_{dn} could be considered acceptable (HUD 2009).

Section 050306-ENO of the Pinal County Municipal Ordinance provides noise limits for excessive noise levels at specific identified land use areas. The Pinal County Municipal Ordinance only applies to unincorporated areas of the County. The City of Coolidge is an incorporated area but does not have an established noise regulation; therefore, the Pinal County Municipal Ordinance applies to the City of Coolidge. However, power plant equipment during normal operation is exempt from these noise limits, as described in 050306-ENO Section 9 – Exemptions. The Pinal County noise regulations are further discussed in the attached noise report (Exhibit I-1).

For purposes of conservative noise impact analysis with respect to anticipated Project operation, the suggested external noise thresholds of 55 dBA L_{dn}, was utilized.

Construction

Typical construction activities at the Project Site would result in a transient increase in the ambient noise level resulting from the operation of construction equipment, as the construction of the Project is expected to occur over a 3-year timeframe. The increase in noise level would be proportional to the distance to the noise source. The extent of the noise effects would depend on the type of construction activity, duration of the construction activity, and the distance between the noise source and receiver. It is anticipated that construction activities would take place during daylight hours (dawn to dusk) up to six days a week (Monday–Saturday).

Predicted construction-generated noise levels at nearby noise sensitive areas (NSAs) were calculated using the Federal Highway Administration's Roadway Construction Noise Model. Estimates of noise from the construction of the Project are based on a roster of the maximum amount of construction equipment used on a given day. Estimated noise levels from construction activities at the closest residential receptor from the center of the construction site were estimated to be approximately 56.8 dBA L_{eq} and 61.8 dBA L_{dn}. Construction noise impacts are further discussed in the attached noise report (Exhibit I-1).

Operations

To determine the potential noise impact from the expected operation of the proposed Project, detailed noise modeling was conducted. Exhibit I-1 provides detailed information on the inputs used to populate the refined model.

The SoundPlan Essential Model Version 5.1 (SoundPlan) was used to estimate sound levels from Project operation at noise sensitive receivers. SoundPlan assesses noise levels near industrial noise sources based on International Organization for Standardization (ISO) 9613-2 standard for noise propagation calculations. The SoundPlan model accounts for sound wave divergence and attenuation factors resulting from air absorption, ground coverage, and barrier and structure shielding.

Modeling included 16 GE LM6000 gas turbine generator packages, 16 SCR units, eight GSU transformers, and other ancillary equipment, such as lube oil fin-fan coolers, gas compressors, and auxiliary transformers. A complete list of equipment included in the model, assumptions, references, and calculation methods are included in Exhibit I-1.

The analysis shows that the sound levels emitted by the proposed Project will be less than 55 dBA L_{dn} at all evaluated noise receptors with exception of the closest sensitive receptor. The projected L_{dn} value at the closest sensitive receptor, residences south of the Project, is estimated to be 59.7 dBA when no background noise is included and 63.1 dBA when background noise is added, which is above the recommended 24-hour average day and night EPA-recommended value of 55 dBA L_{dn}.

The modeled noise levels were then added to the ambient noise levels that were measured to determine the potential cumulative effect the Project could present. The results of this analysis showed a change in noise levels that ranged from 0.5 to 2.6 dBA at the evaluated receptors. The human perception for change in sound level (i.e., potential increase above ambient) is estimated as 2.6 dBA. In general, an increase of 3 decibels (dB) or below is perceived by the human ear as barely noticeable. Therefore, the proposed operation would not result in a substantial permanent increase in ambient noise levels in the vicinity of the Project.

Corona Noise

Audible noise associated with transmission lines as a result of corona discharge is a function of line voltage. Transmission line audible noise is characterized by crackling, frying, sputtering, and low-frequency tones which are best described as humming sounds. Audible noise from transmission lines primarily occurs during foul weather conditions. Noise above existing ambient levels is not expected to occur outside the proposed transmission line right-of-way (ROW) for the Project.

Communication Interference

High-voltage transmission line radio frequency noise is not expected to be noticeable outside the immediate vicinity of the transmission lines. Radio interference is most likely to affect the amplitude modulation (AM) broadcast band; frequency modulation (FM) radio is rarely affected by transmission lines. Only AM receivers located immediately adjacent to the transmission line have the potential to be affected by radio interference, and the effect may only be significant during rainy weather.

The radiated noise field intensity diminishes with increasing frequency. At frequencies above 30 Megahertz, the radiated noise field intensity is so low it is difficult to detect. Therefore, FM radio reception and cellular telephone communication are above the frequency range where radio interference has been experienced with previous projects, and no objectionable interference is expected with any of the Project components. At the frequency range of FM radio or above, any rare instance of interference would generally be due to microsparks, which can be identified and corrected.

SRP utilizes field intensity instrumentation capable of measuring radiated noise and interference from 150 Kilohertz up to 1 Gigahertz. These instruments are used for investigating reports of unusual relatively high transmission line noise, as well as for compiling ambient noise level data.

Radio interference is expected to be minimal, due to the predominately industrial and suburban character of the area along the Project and the proposed ROW widths for the Project. Furthermore, SRP is ready to address radio interference resulting from construction and operation of the transmission line with corrective measures such as smoothing nicks on the conductor surface or tightening hardware. In addition to any transmission repairs, relevant corrective actions may include adjusting or modifying receivers; adjusting, repairing, replacing, or adding antennas; antenna signal amplifiers; filters or lead-in cables; or other corrective actions. Based on the design parameters and physical configuration of the proposed facilities for the Project, no objectionable noise and interference with radio signals is anticipated.

Conclusions

Predicted Project construction noise levels may temporarily exceed 55 dBA, but activities causing these temporary elevated noise levels could be permitted given prior written approval and will operate during allowable construction process hours as presented in Section 050306-ENO of the Pinal County Municipal Ordinance.

The noise impact assessment indicated that noise generated by the Project will be higher than 55 dBA L_{dn} at the nearest noise receptors. However, the noise impact from the Project alone at the nearest receptor (59.7 dBA L_{dn}) is lower than the ambient sound level measured at this same location under existing conditions (60.5 dBA L_{dn}).

The impact from the Project on the cumulative sound levels (ambient noise levels combined with the predicted noise levels generated by the Project) is estimated to yield an increase of 0.5 to 2.6 decibels over existing ambient noise levels at the nearest noise receptors. In general, a 3 dB increase is perceived by the human ear as barely noticeable. Therefore, the proposed addition of the Project will have a minimal noise impact on the nearest residential receptor in the vicinity of the Project.

Audible noise from transmission lines primarily occurs during foul weather conditions. Noise above existing ambient levels is not expected to occur outside the proposed transmission line ROW for the Project.

No objectionable noise and interference with radio signals is anticipated.

References

Environmental Protection Agency. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Available at: http://www.nonoise.org/library/levels/levels.htm/. Accessed October 2021.

Housing and Urban Development. 2009. HUD Noise Guidebook. Available at: https://www.hudexchange.info/resource/313/hud-noise-guidebook/. Accessed October 2021.

EXHIBIT I-1 – NOISE TECHNICAL REPORT FOR THE COOLIDGE EXPANSION PROJECT

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Noise Technical Report for the Coolidge Expansion Project

NOVEMBER 2021

PREPARED FOR

Salt River Project Power Generation

PREPARED BY

SWCA Environmental Consultants

NOISE TECHNICAL REPORT FOR THE COOLIDGE EXPANSION PROJECT

Prepared for

Salt River Project
1521 Project Drive
Tempe, Arizona 85281
Attention: William McClellan, Spence Wilhelm, and Joseph Gardner

Prepared by

SWCA Environmental Consultants
20 East Thomas Road, Suite 1700
Phoenix, Arizona 85012
www.swca.com

SWCA Project No. 65028

November 2021

CONTENTS

Appendices

Figures

Tables

1 INTRODUCTION

SWCA Environmental Consultants (SWCA) prepared this noise technical report in support of the proposed Coolidge Expansion Project. The project, an 820-MW generating facility, would be developed by Salt River Project Agricultural Improvement and Power District (SRP). The project would be located in Pinal County within the city of Coolidge at 859 East Randolph Road.

This report presents the analysis and noise impact estimates for the construction and operation of the Coolidge Expansion Project at noise sensitive areas (NSAs) to demonstrate that the proposed activities associated with this project will not result in a substantial permanent increase in ambient noise levels in the vicinity of the project.

2 PROJECT AND STUDY DESCRIPTION

Coolidge Generating Station is an existing electric generating facility that is owned and operated by SRP. The facility currently consists of 12 simple cycle combustion turbines (General Electric [GE] LM6000PC) and ancillary equipment that produce approximately 575 MW of electrical gross output at ISO conditions at project elevation. As a peaking facility, it runs only a limited amount of time when needed, up to the limit of its operating permits, to supplement base-load generation resources or firm renewable generation resources.

SRP proposes to expand the existing Coolidge Generating Station through the installation of equipment and facilities within the existing power plant boundary (95 acres) and the parcel directly to the south of the existing power plant (approximately 100 acres). The Coolidge Expansion Project will include the installation of GE LM6000PC combustion turbines with a nameplate capacity of approximately 820 MW.

Potential noise impacts from construction and operation of the project were evaluated by determining the projected increases over ambient conditions and potential exposure of sensitive receptors to excessive noise from the proposed noise-generating sources.

Construction of the Project will consist of earth work (e.g., site grading, clearing & grubbing) and construction of the site buildings, mechanical and electrical work. Predicted construction-generated noise levels at nearby NSAs were calculated using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). The RCNM is FHWA's national model for the prediction of construction noise

Among project components, the sources with potential to impact ambient noise levels are the 16 GE LM6000 gas turbine generator packages, 16 selective catalytic reduction (SCR) units, eight generator step-up (GSU) transformers, and other ancillary equipment, such as lube oil fin-fan coolers, gas compressors, and auxiliary transformers.

The noise impact evaluation for the operation of the project, provided herein, consists of computer noise modeling using SoundPLAN Essential Version 5.1 and assessment of the outputs as they pertain to the sound (noise) standards and nearest NSAs (i.e., nearest residences).

3 SOUND FUNDAMENTALS – BACKGROUND

Sound is defined as a form of energy that is transmitted by pressure variations, which the animal or human ear can detect. Noise can be defined as any unpleasant or unwanted sound that is unintentionally added to a desired sound or environment. The noise effects in humans include interference with communication, learning, rest, or sleep and physiological health effects.

There are two main properties of sound: the amplitude and the frequency. Amplitude refers to the level of energy that reaches the ear (how loud we perceive the sound), while frequency is the number of cycles or oscillations per unit of time completed by the source. Frequency is normally expressed in hertz (Hz).

Sound power is defined as the measurement of the ability of a source to make sound. It is independent of the acoustic environment in which is located. The sound power level (L_{pw}) of a source is the amount of energy it produces relative to a reference value and is normally expressed in decibels. The decibel is a logarithmic scale to describe the sound pressure ratio.

Humans perceive a frequency range of about 20 Hz to about 20,000 Hz. An internationally standardized frequency weighting, the A-weighting scale, was designed to approximate the audible range of frequencies of a healthy human ear. The A-weighting scale corresponds to the fact that the human ear is not as sensitive to sound at the lower frequencies as it is at the higher frequencies.

3.1 Definition of Acoustical Terms

A number of different descriptors of time-averaged sound levels are used to account for fluctuations of sound intensity over time. The sound descriptors calculated by the sound meters and used in this report to describe environmental sound are defined below. Additionally, the following acoustical terms are used throughout this analysis:

- Ambient sound level is defined as the composite of noise from all sources near and far, the normal or existing level of environmental noise at a given location.
- Decibel (dB) is the physical unit commonly used to measure sound levels. Technically, a dB is a unit of measurement that describes the amplitude of sound equal to 20 times the base 10 logarithm of the ratio of the reference pressure to the sound of pressure, which is 20 micropascals (μPa). In acoustics, sound levels represented in dB express the true unweighted noise level.
- Sound measurement is further refined by using a decibel A-weighted sound level (dBA) scale that more closely measures how a person perceives different frequencies of sound; the A-weighting reflects the sensitivity of the ear to low or moderate sound levels.
- Equivalent noise level (L_{eq}) is the energy average A-weighted noise level during the measurement period.
- The root-mean-squared maximum noise level (L_{max}) characterizes the maximum noise level as defined by the loudest single noise event over the measurement period.
- Day-night sound level (L_{dn}) is the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB weighting imposed on the equivalent sound levels occurring during night-time hours (10 p.m. [22:00] to 7 a.m. [07:00]).
- Daytime Sound Level (L_d) is defined as the equivalent sound level for a 15-hour period between 7 a.m. (07:00) and 10 p.m. (22:00).
- Nighttime Sound Level (L_n) is defined as the equivalent sound level for a 9-hour period between 10 p.m. (22:00) and 7 a.m. (07:00).
- Residual sound level (L_{90}) is the level that is exceeded 90% of the time over a specified period. The residual sound level excludes intruding sound from sporadic anthropogenic noises, wildlife, and wind gusts that raise the average and maximum levels over a measurement period.

3.2 Sound Levels of Representative Sounds and Noises

The U.S. Environmental Protection Agency (EPA) has developed an index to assess noise impacts from a variety of sources using residential receptors. If L_{dn} values exceed 65 dBA, residential development is not recommended (EPA 1979). Noise levels in a quiet rural area at night are typically between 32 and 35 dBA. Quiet urban night-time noise levels range from 40 to 50 dBA.

Noise levels during the day in a noisy urban area are frequently as high as 70 to 80 dBA. Noise levels above 110 dBA become intolerable; levels higher than 80 dBA over continuous periods can result in hearing loss. Levels above 70 dBA tend to be associated with task interference. Levels between 50 and 55 dBA are associated with raised voices in a normal conversation.

Table 1 presents sound levels for some common noise sources and the human response to those decibel levels.

Table 1. Sound Levels of Representative Sounds and Noises

Source and Distance	Sound Level (dBA)	Human Response
Jet takeoff (nearby)	150	
Jet takeoff (15 m/50 feet)	140	
50-hp siren (30 m/100 feet)	130	
Loud rock concert (near stage)	120	Pain threshold
Construction noise (3 m/10 feet)	110	Intolerable
Jet takeoff (610 m/2,000 feet)	100	
Heavy truck (8 m/25 feet)	90	
Garbage disposal (0.6 m/2 feet)	80	Constant exposure endangers hearing
Busy traffic	70	
Normal conversation	60	
Light traffic (30 m/100 feet)	50	Quiet
Library	40	
Soft whisper (4.5 m/15 feet)	30	Very quiet
Rustling leaves	20	
Normal breathing	10	Barely audible
Threshold of hearing	0	

Source: Beranek (1988).

Table 2 provides criteria that have been used to estimate an individual's perception of increases in sound. In general, an average person perceives an increase of 3 dBA or less as barely perceptible. An increase of 10 dBA is perceived as a doubling of the sound.

Table 2. Average Human Ability to Perceive Changes in Sound Levels

Increase in Sound Level (dBA)	Human Perception of Sound
2–3	Barely perceptible
5	Readily noticeable
10	Doubling of the sound
20	Dramatic change

Source: Bolt Beranek and Newman, Inc. (1973).

4 EXISTING CONDITIONS

4.1 Existing Land Use and Site Conditions

The project area is located within the Lower Colorado River Valley subdivision of the Sonoran Desertscrub Biotic Community with an elevational range of approximately 1,440 to 1,451 feet above mean sea level (amsl). The project area is located 0.3 mile east of Arizona State Route 87/Arizona State Route 287, 0.3 mile south of East Randolph Road, and 0.1 mile north of East Kleck Road. The project area is bordered by North Vail Road on the east. An existing transmission line runs north-south just outside the west project boundary, and Union Pacific Railroad tracks run parallel to the west boundary, approximately 0.03 mile west of the project area. Land uses in the surrounding area include agriculture, residential, and industrial development.

The mean annual temperature is 70 degrees Fahrenheit (°F) with average maximum temperatures ranging from 66°F to 106°F and average minimum temperatures from 36°F to 76°F. Average annual precipitation is only 9 inches. Most of the precipitation occurs during the winter from December through March and during the "monsoonal" months of July and August (U.S. Climate Data 2021).

4.2 Existing Sound Conditions

4.2.1 *Measurement Locations*

SWCA performed an ambient noise survey from August 11 through 13, 2021. The purpose of the survey was to characterize the noise environment in the vicinity of the project. Monitoring locations are mapped on Figure 1 and are listed below in Table 3. Appendix A provides photographs of the long-term monitoring locations.

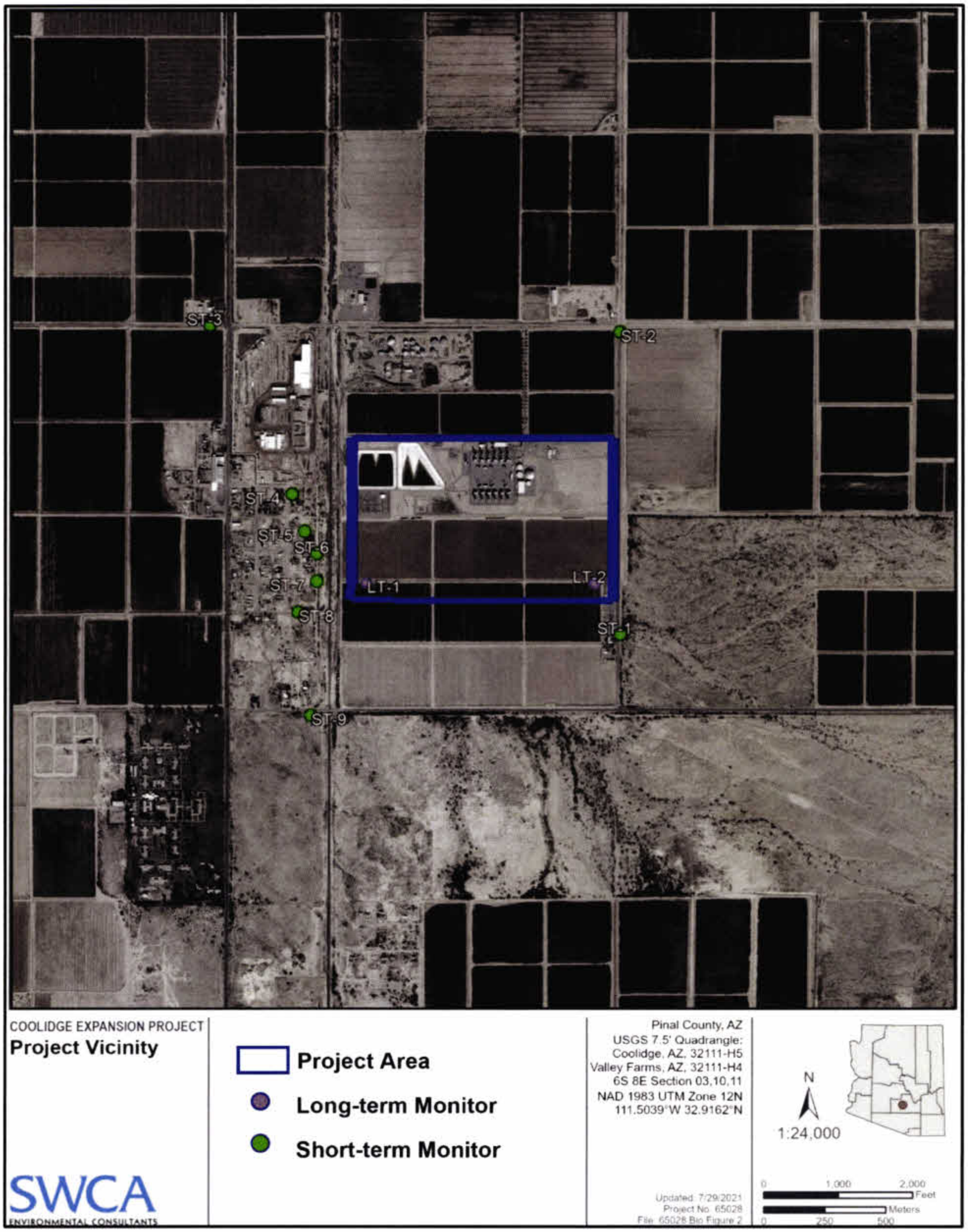

Figure 1. Local area map.

Table 3. Monitoring Locations

Monitor	Monitor Location		Elevation (feet amsl)
	Latitude	Longitude	
LT-1 – West property boundary	32°54'48" N	111°30'32" W	1,445
LT-2 – East property boundary	32°54'48" N	111°29'56" W	1,451
ST-1 – 5310 N Vail Road	32°54'41" N	111°29'52" W	1,441
ST-2 – 4490 N Vail Road	32°55' 22" N	111°29'52" W	1,441
ST-3 – 134 W Randolph Road	32°55'23" N	111°30'57" W	1,449
ST-4 – 4103 N Kennedy Street	32°55'00" N	111°30'44" W	1,448
ST-5 – 3975 N Kennedy Street	32°54'55" N	111°30'42" W	1,445
ST-6 – 5177 E Malcolm X Street	32°54'52" N	111°30'40" W	1,450
ST-7 – 3766 E Newman Street	32°54'48" N	111°30'40" W	1,450
ST-8 – E Bell Street and Hudges Street	32°54'44" N	111°30'43" W	1,450
ST-9 – 5160 E Kleck Road	32° 54'30" N	111°30'41" W	1,449

4.2.2 *Instrument Description*

Noise measurements were collected using three Larson Davis Precision Integrating Sound Level Meter Model 831C meeting the requirements of the American National Standards Institute (ANSI 2013), three PCB PRM831 preamplifiers, and three PCB 377B02 free-field microphones as described in Table 4. Two sets of instrumentation were used at the two long-term monitoring locations, and one set of instrumentation was used for all of the short-term locations.

Each microphone was fitted with an environmental windscreen and bird spikes and set up on a tripod at a height of 5 feet (1.5 m) above ground and placed as far from the influence of vertical reflective sources as possible. All cables were secured to prevent any sounds due to wire movement. All clocks associated with the sound measurement were synchronized using the Larson Davis G4 LD Utility software.

Table 4. Instrumentation

Monitoring Location	Sound Level Meter	Preamplifier	0.5-inch free-field microphone
LT-1	Larson Davis 831C (S/N 0010737)	PRM831 (S/N 58504)	377B02 (S/N 311602)
LT-2	Larson Davis 831C (S/N 0010739)	PRM831 (S/N 58503)	377B02 (S/N 311601)
ST-1, ST-2, ST-3, ST-4, ST-5, ST-6, ST-7, ST-8, ST-9	Larson Davis 831C (S/N 0011451)	PRM831 (S/N 19221)	377B02 (S/N 329129)

Note: S/N = Serial Number.

4.2.3 *Calibration Checks*

The sound level meters were calibrated at the beginning and end of the measurement period using a Larson Davis Model CAL200 Precision Acoustic Calibrator. The Larson Davis CAL200 emits a 1-kHz tone at 114 dB against which the response can be checked. The calibrator has been designed for both field and laboratory use, and the accuracy has been calibrated to a reference traceable to the National Institute of Standards and Technology.

As recommended by Larson Davis, when using a free-field microphone, the pressure level at the microphone diaphragm will be slightly different. Thus, a free field correction of -0.12 dB was applied to the 114.0-dB tone. Thus, the calibration level was set to 113.88 dB. All Larson Davis 831 models showed a response of less than the normal error of 0.50 dB.

4.2.4 *Meteorological Data*

Approximately 48 hours of noise data were collected during the survey and validated against weather data from the Coolidge Station (KAZCOOLI22) located approximately 4.6 miles east of the Project. Survey weather conditions are presented in Table 5.

Table 5. Weather Conditions for August 11 through August 13, 2021

Weather Station	Monitoring Start	Monitoring End	Wind Speed (mph)		Temperature (°F)		Humidity (% relative humidity)	
			Range	Avg.	Range	Avg.	Range	Avg.
Coolidge Station	8/11/2021 11:30	8/13/2021 14:41	0–7	2.9	73–95	84.6	43–85	63

Note: mph = miles per hour; avg. = average.

The American Society for Testing and Materials (ASTM) Standard Guide for Measurement of Outdoor A-Weighted Sound Levels (ASTM 2012) specifies that data should not be used when steady wind speeds exceed 20 km per hour (12.4 miles per hour). No data points were removed from the long-term or short-term sound data sets due to high-wind events.

4.2.5 *Existing Sound Levels*

In order to determine the baseline or ambient sound levels experienced near the project area and at the closest noise-sensitive areas, ambient sound surveys were performed of the area. Long-term and short-term sound monitoring was conducted from August 11 to 13, 2021, to document the acoustic environment in the area surrounding the proposed Project. Table 6 summarizes the measured A-weighted L_{eq}, L_{90}, and L_{dn} (calculated from the measured L_{eq}) for each of the monitoring locations.

Existing conditions at the short-term sound monitoring sites are better represented by the L_{90} parameter. As defined above, the 90th percentile-exceeded sound level, L_{90}, is a metric that indicates the single sound level that is exceeded during 90% of a measurement period although the actual instantaneous sound levels fluctuate continuously.

The L_{90} sound level is typically considered the ambient sound level, as it quantifies the acoustical character of an environment and represents the residual (i.e., ambient) sound level between discrete sound events of short duration, such as bird chirps, dog barks, car horns, etc. The measured L_{90} time intervals are arithmetically averaged to present the background levels of the environment for day and night.

Table 6. Summary of Ambient Sound Measurements

Monitoring Location	Monitoring Start	Monitoring End	Elapsed Time	Measured Sound Levels*				
				L_{eq}	L_{90}	L_{dn}	L_d	L_n
LT-1 – West property boundary	8/11/2021 12:33	8/13/2021 14:19	48:38	**48.2**	43.0	55.2	47.5	49.0
LT-2 – East property boundary	8/11/2021 13:38	8/13/2021 14:41	48:05	**51.5**	46.8	60.5	46.4	54.9
ST-1 – 5310 N Vail Road	8/13/2021 15:08	8/13/2021 15:32	00:23	43.9	**36.5**	–	43.9	–
ST-2 – 4490 N Vail Road	8/13/2021 14:30	8/13/2021 15:00	00:29	52.1	**41.2**	–	52.1	–
ST-3 – 134 W Randolph Road	8/12/2021 15:17	8/12/2021 15:49	00:32	73.2	**45.0**	–	73.2	–
ST-4 – 4103 N Kennedy Street	8/12/2021 15:57	8/12/2021 16:22	00:25	48.7	**39.7**	–	48.7	–
ST-5 – 3975 N Kennedy Street	8/12/2021 16:33	8/12/2021 16:51	00:18	42.8	**38.3**	–	42.8	–
ST-6 – 5177 E Malcolm X Street	8/13/2021 15:44	8/13/2021 16:05	00:21	44.3	**40.1**	–	44.3	–
ST-7 – 3766 E Newman Street	8/13/2021 16:12	8/13/2021 16:32	00:20	46.1	**40.6**	–	46.1	–
ST-8 – E Bell Street and Hudges Street	8/13/2021 16:56	8/13/2021 17:22	00:26	48.7	**44.8**	–	48.7	–
ST-9 – 5160 E Kleck Road	8/13/2021 17:30	8/13/2021 17:54	00:24	74.7	**38.4**	–	74.7	–

* Data derived from the average 1-hour L_{eq} calculated by logarithmic averaging the number of sound measurements taken at each specific hour.

Measurement duration was sufficient to ensure natural variation in sound levels and meteorological conditions were covered. Observed sources of background sound that contributed to the existing sound level at the monitoring locations included road traffic, birds, insects, trains, and airplanes.

Table 7 provide the sound levels assumed to represent the baseline sound levels at the project area.

Table 7. Representative Ambient Sound Levels

Parameter	Calculated L_{eq} Total (dBA)	Community Sound Level (dBA)		
		L_{day}	L_{night}	L_{dn}
LT-1 (August 11–13, 2021, survey)*	**48.2**	47.5	49.0	55.2
LT-2 (August 11–13, 2021, survey)*	**51.5**	46.4	54.9	60.5

* L_{eq} and L_{dn} values were estimated from L_{day} and L_{night} values.

These sound levels would occasionally increase due to passing vehicular or railroad traffic. There were also temporary increases in the existing sound level from farm equipment (e.g., tractors) used to grow and harvest crops and to raise cattle and other farm animals, or from other commercial or industrial sources identified in the analysis area. During the noise measurements any identifiable dominant background noise source, based on observations of the field technician, was noted. Field data sheets were completed for each measurement and are provided in Appendix B of this report.

4.2.6 *Nearest Receptor Sites*

Noise-sensitive areas generally are defined as locations where people reside or where the presence of unwanted sound may adversely affect the existing land use. Typically, noise-sensitive land uses include residences, hospitals, places of worship, libraries, performance spaces, offices, and schools, as well as nature and wildlife preserves, recreational areas, and parks. The closest receptor is a residence approximately 488 feet south of the nearest project boundary.

4.3 Regulatory Setting

4.3.1 *Federal*

In 1974 the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety*. In this publication, the EPA evaluated the effects of environmental noise with respect to health and safety and determined an L_{dn} of 55 dBA (equivalent to a continuous noise level of 48.6 dBA) to be the maximum sound level that will not adversely affect public health and welfare by interfering with speech or other activities in outdoor areas.

4.3.2 *State*

No applicable noise regulations were identified for the project.

4.3.3 *Local*

4.3.3.1 PINAL COUNTY

The Pinal County Excessive Noise Ordinance (Section 050306-ENO) prescribes noise limits along property boundaries according to the land use category as shown in Table 8. The Pinal County Municipal Ordinance applies to unincorporated areas of the County. The City of Coolidge is an incorporated area but does not have an established noise regulations applicable to this project, so the Pinal County Municipal Ordinance applies to the City of Coolidge.

Table 8. Limiting Sound Levels for Land Use Districts

Zoning District Classifications	L_{eq} Limits
Residential: CR-1A, CR-1, CR-2, CR-3, CR-4, CR-5, OS, MH, RV, MHP, PM/RVP, TR	60 dBA (7 a.m.–8 p.m.) 55 dBA (8 p.m.–7 a.m.)
Commercial or Business: CB-1, CB-2	65 dBA (7 a.m.–10 p.m.) 60 dBA (10 p.m.–7 a.m.)
Industrial: CI-B, CI-1, CI-2	70 dBA (7 a.m.–10 p.m.) 65 dBA (10 p.m.–7 a.m.)
Rural: CAR, SR, SR-1, SH, GR, GR-5, GR-10	65 dBA (7 a.m.–9 p.m.) 60 dBA (9 p.m.–7 a.m.)

Source: Pinal County (2011).

Note: The L_{eq} limits specified are L_{eq} for a 2-minute time interval. Partial L_{eq} levels may be obtained as necessary to assure an accurate indication of the representative sound environment for the site.

Sound projected from property within one zoning district into property within another zoning district of a lesser sound level limit shall not exceed such lesser sound level limit.

Power plant equipment during normal operation is exempt from these noise limits, as described in 050306-ENO Section 9 – Exemptions.

Additionally, 050306-ENO does not limit noise from construction but does limit the allowed operation times for construction to occur to the following:

- Concrete Work – 5:00 a.m. to 7:00 p.m. from April 15 to October 15 and 6:00 a.m. to 7:00 p.m. from October 16 to April 14.
- Other Types of Construction – 6:00 a.m. to 7:00 p.m. from April 15 to October 15 and 7:00 a.m. to 7:00 p.m. from October 16 to April 14.
- Construction and repair work in non-residential areas, not within 500 feet of a residential property, shall not begin prior to 5:00 a.m. and must stop by 7:00 p.m. or at such other times as authorized by permit.
- Weekends and Holidays Excluded – Construction or repair work shall be limited to 7:00 a.m. to 7:00 p.m. and concrete pouring shall be limited to 6:00 a.m. to 7:00 p.m.+

Construction outside the time periods specified above is allowed if an appropriate permit has been obtained beforehand from the country.

4.3.3.2 CITY OF COOLIDGE

No applicable noise regulations were identified for the project.

5 NOISE IMPACTS

The following section provides results and interpretation of potential impacts from noise generated by the project during construction and operation phases.

5.1 Noise Assessment Components

A noise assessment is based on the following components: a sound-generating source, a medium through which the source transmits, the pathways taken by these sounds, and an evaluation of the proximity to NSAs. Soundscapes are affected by the following factors:

- Source. The sources of sound are any generators of small back-and-forth motions (i.e., motions that transfer their motional energy to the transmission path where it is propagated). The acoustic characteristics of the sources are very important. Sources must generate sound of sufficient strength, approximate pitch, and duration so that the sound may be perceived and can cause adverse effects, compared with the natural ambient sounds.
- Transmission path or medium. The transmission path or medium for sound or noise is most often the atmosphere (i.e., air). For the noise to be transmitted, the transmission path must support the free propagation of the small vibratory motions that make up the sound. Atmospheric conditions (e.g., wind speed and direction, temperature, humidity, precipitation) influence the attenuation of sound. Barriers and/or discontinuities (e.g., existing structures, topography, foliage, ground cover, etc.) that attenuate the flow of sound may compromise the path. For example, sound will travel very well across reflective surfaces such as water and pavement but can attenuate across rough surfaces (e.g., grass, loose soil).
- Proximity to NSAs. An NSA is defined as a location where a state of quietness is a basis for use or where excessive noise interferes with the normal use of the location. Typical NSAs include

residential areas, parks, and wilderness areas, but also include passive parks and monuments, schools, hospitals, churches, and libraries.

5.2 Construction Noise

The noise levels generated by construction equipment vary significantly and depend on a number of different parameters, such as the type, model, size, and condition of the equipment; the operation schedule; and the condition of the area being worked. Additionally, construction projects are accomplished in several different stages. Each stage has a specific equipment mix, depending on the work to be completed. Construction of the project facility is expected to occur over a 3-year timeframe. Typical construction activities would take place during daylight hours (dawn to dusk) up to six days a week (Monday–Saturday). The following sections estimate noise levels related to the construction of the project.

5.2.1 *Equipment and Machinery*

Construction is expected to occur in phases between the years of 2022 and 2025. These phases are expected to include initial sitework and mobilization, material deliveries, earthwork and underground utilities, foundation work, equipment and mechanical work, electrical work, startup/commissioning, operational testing, and final grading/paving. During these construction phases, different equipment will be required on-site that will result in varying emission rates due to construction activities. Noise levels for typical construction equipment that would likely be used at the project are in the approximately 70 to 90 dBA range at a distance of 50 feet, as shown in Table 9.

Table 9. Noise Levels for Common Construction Equipment

Equipment Type	Typical Maximum Noise Levels at 50 Feet (dBA)
Backhoe	80
Belly Dump	76
Compactor	83
Concrete Telebelt	81
Crane	81
Drill Rig	79
Dozer	82
Excavator	81
Forklift	85
Flatbed	74
Grader	85
Generator	81
Loader	79
Scraper	84
Tractor	84
Trencher	80
Truck	75

Source: RCNM Software Version 1.1 (FHWA 2011). Table based on EPA report and measured data.

Construction noise levels were estimated using the RCNM. The RCNM is FHWA's national model for the prediction of construction noise. This software is based on actual sound level measurements from various equipment types taken during the Central Artery/Tunnel Project conducted in Boston, Massachusetts, during the early 1990s (FWHA 2011).

Estimates of noise from the construction of the project are based on a roster of the maximum amount of construction equipment used on a given day. Table 9 showed a list of typical construction equipment and the noise level at 50 feet. The RCNM has noise levels for various types of equipment preprogrammed into the software; therefore, the noise level associated with the equipment is typical for the equipment type and not based on any specific make or model.

The RCNM assumes that the maximum sound level for the project (L_{max}) is the maximum sound level for the loudest piece of equipment. The approximate noise generated by the construction equipment used at the facility has been conservatively calculated based on an estimated project construction equipment roster projected to be used at the construction site, and not considering further attenuation due to atmospheric interference or intervening structures.

The equipment and activities on-site would vary throughout the project, depending on various stages of construction. The predicted noise from construction activity is presented as a worst-case (highest noise level) scenario, where it is assumed that all equipment is present and operating simultaneously on-site for the construction phase. Therefore, noise levels at various distances from the center of the construction site can be predicted and are shown in Table 10.

Table 10. Predicted Construction Noise Levels

Distance (feet)	Construction L_{eq} (dBA)	Construction L_{max} (dBA)*
25	97.2	97.0
50	91.2	91.0
100	85.2	85.0
200	79.1	79.0
250	77.2	77.0
500	71.2	71.0
1,000	65.2	65.0
2,000	59.1	59.0
4,000	53.1	52.9
5,000	51.2	51.0

* Calculated L_{max} is the loudest individual value.

Estimated noise levels from construction activities at the closest NSA from the center of the construction site were estimated to be approximately 56.8 dBA L_{eq} and 61.8 dBA L_{dn}. Regarding the human perception for change in sound level (i.e., potential increase above ambient), is estimated as 5.3 dBA, perceived by the human ear as readily noticeable.

Construction is transient in nature and noise levels vary depending on the activity in progress. Noise impacts to residents due to the construction of the Project would be temporary and intermittent.

5.3 Operational Noise

To determine the potential noise impact from these sources, detailed noise modeling was conducted. The noise levels at the identified NSAs in the vicinity of the project from the operation of the GE LM6000 PC SPRINT NxGen combustion turbine generators have been predicted and compared with the relevant noise criteria, including the EPA's L_{dn} of 55 dBA at residential NSAs.

5.3.1 *Operational Activities*

The primary noise sources anticipated due to operation of the proposed power plant are 16 GE LM6000 gas turbine generator packages, 16 SCR units, eight GSU transformers, and other ancillary equipment, such as lube oil fin-fan coolers, gas compressors, and auxiliary transformers. Secondary noise sources are anticipated to include miscellaneous pumps, fans, and compressors. The combustion turbines are housed in a metal enclosure to protect the units from the elements and for noise reduction.

5.3.2 *Noise Profile*

The sound power level (L_{pw}) for each equipment noise source is listed in Table 11. These equipment sound level specifications are provided from the vendors based on standard GE LM6000 PC SPRINT NxGen combustion turbine generator packaged equipment. All equipment sound levels were estimated based on available data from the equipment manufacturers or obtained from other sources or calculations where manufacturer's data were not available.

Table 11. Equipment Sound Power Levels

Project Component	Sound Power Level (dB) at Octave Band Center Frequency (Hz)									Total Sound Power Level (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
Ammonia Skid	90	90	87	89	86	85	80	85	78	90
Auxiliary Skid with Enclosure	84	87	98	93	89	90	88	82	74	95
Combustion Air Inlet Filter	102	102	98	92	87	87	85	83	72	93
Exhaust Expansion Joint	100	101	98	97	95	92	89	87	78	98
Filter House Shell Surface Break-out	105	98	95	70	60	51	59	68	70	81
Gas Compressor Skid	100	101	103	106	103	102	98	95	92	107
Generator Enclosure	107	106	106	94	89	90	86	77	77	95
Generator Ventilation Exhaust	99	96	109	103	93	100	99	100	89	106
GSU Transformer	98	100	106	102	104	93	89	85	82	103
Intake Silencer Shell Break-out	102	98	89	87	86	88	89	84	81	94
Lube Oil Fin-fan Cooler	107	108	101	98	96	92	89	85	78	98
SCR Duct Breach Section	104	99	92	88	77	62	58	55	43	82
SCR Duct Carbon Monoxide Section Sides	106	101	94	90	81	66	62	60	49	85
SCR Duct Carbon Monoxide Section Top	106	101	95	91	82	67	63	61	49	86
SCR Duct SCR Section	106	101	94	90	80	64	60	57	46	85
SCR Duct Section 1 Sides	112	97	81	74	62	45	36	28	13	76

Project Component	Sound Power Level (dB) at Octave Band Center Frequency (Hz)									Total Sound Power Level (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
SCR Duct Section 1 Top	113	105	96	92	83	68	64	62	51	87
SCR Duct Section 2 Sides	115	107	98	94	85	70	66	64	53	89
SCR Duct Section 2 Top	115	107	98	94	85	70	66	64	53	89
SCR Duct Section 3 Sides	114	106	97	93	84	69	65	63	52	88
SCR Duct Section 3 Top	114	106	97	93	84	69	65	63	52	88
SCR Tempering Air Fan Casing	91	91	94	94	91	90	89	84	78	95
SCR Tempering Air Fan Inlet	98	98	100	96	95	94	89	87	82	98
Stack Casing Lower Portion	99	100	98	94	84	72	68	65	54	88
Stack Casing Lower Silencer Portion	100	100	96	92	81	64	60	57	47	86
Stack Casing Upper Portion	100	98	87	67	47	40	39	48	46	75
Turbine Enclosure	108	105	101	95	91	84	85	87	83	95
Turbine Exhaust Stack Exit with SCR and Silencer	130	127	115	100	85	81	78	85	82	104
Turbine Vent Exhaust	103	104	96	91	77	75	74	68	59	86
Turbine Vent Motor and Fan Surface	101	98	99	99	91	89	84	85	80	96

Source: ATCO (2008).

5.3.3 *Assessment Methodology*

Based on the sound power levels for each of the sources, SoundPLAN estimates noise contours of the overall project in accordance with a variety of standards, primarily International Standards Organization (ISO) 9613-2:1996, Acoustics, standards for noise propagation calculations. All sound propagation losses, such as geometric spreading, air absorption, ground absorption, and barrier shielding, are calculated in accordance with these recognized standards.

The model accounts for reflection, from adjacent structures and the ground. The model uses industry-accepted propagation algorithms and accepts sound power levels (in dB) provided by the manufacturer and other sources. The calculations account for classical sound wave divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. SoundPLAN does not account for noise modulation or refraction.

The sound propagation model considers the following influences:

- sound power levels and locations of noise sources
- distance between noise sources and receivers
- topography of the area
- influence of the absorption provided by the ground
- shielding from structures or vegetation
- air absorption
- meteorological conditions

The ISO 9613-2 methodology provides tables and equations for estimating the atmospheric absorption coefficient corresponding to various temperatures and humidity levels. For estimating noise levels at the NSAs the annual average temperature of 70°F for Coolidge, Arizona, a relative humidity of 4%, and an air pressure of 1013 millibars were employed. Topographic inputs were also included in the model. Calculations were performed using octave band sound power spectra as inputs for each noise source.

The ISO 9613-2 standard estimates sound pressure levels at a specified distance by subtracting the attenuation factors from the source sound power level for each source in octave frequency bands. Attenuation factors include geometrical divergence, atmospheric attenuation, ground effect, and barrier attenuation. These terms are defined as follows.

Geometrical divergence occurs as the source sound power is spread out over an increasing surface area (i.e., as the distance from the source increases). The estimated loss rate is the same for all frequencies. This is considered the most significant loss associated with propagation. Attenuation due to geometrical divergence is highly dependent on the distance between the source and the receiver. Direction also affects the noise level; 0° direct line of sight noise level will be higher than 90° direction line of sight to a stack emission point. Therefore, the differences in ground elevation and receiver height and hub height (source height) are important parameters. Losses due to atmospheric attenuation occur as the energy in the sound wave is transformed to heat. As this attenuation is frequency dependent and high frequencies are more readily attenuated than low frequencies, these losses are highly influenced by humidity and temperature. Ground effect is described according to the parameter Ground Factor, which varies between 0 for surfaces with low porosity ("hard" ground) and 1 for "soft" ground (surfaces including loose dirt, grass, crops, and other vegetation). This factor describes the effect of sound waves reflected off the ground. Parameters influencing the ground effect are the source height, receiver height, and propagation distance between the source and receiver and the ground conditions. Barrier attenuation describes the effect of sound waves refracted around an imperforate element or barrier. A barrier could include human-made objects such as structures, buildings, and fences, as well as topographical features. Therefore, the differences in ground elevation, source height, receiver height, dimensions, and location absorption and reflection coefficients of human-made structures and topographic features are important parameters when estimating barrier attenuation in SoundPLAN.

The following assumptions were made when running SoundPLAN:

- Noise impact calculations were performed using octave band data from 31 Hz to 8 kHz.
- The model assumed all proposed noise-generating sources operated concurrently.
- Noise impacts at the NSAs and depicted in the isopleths were estimated assuming a receiver height of 5 feet above ground level.
- Elevations of the sources and of the receptors examined in the modeling were determined from U.S. Geological Survey Digital Elevation Map (DEM) and are based on North American Datum of 1927. The DEM files each had a 100-foot resolution (7.5-minute DEM providing coverage of 7.5 × 7.5-minute blocks).
- Atmospheric attenuation was modeled using annual average conditions for Coolidge, Arizona (i.e., temperature of 70°F and 4% humidity).
- To better represent the actual conditions of the proposed project and to ensure that both hard and soft ground absorption were considered, acoustically hard sites including surfaces such as pavement and bare hard ground were assumed to have high reflectivity properties and a ground absorption coefficient of 0.0 was used. Ground cover in the vicinity of the project was analyzed using satellite imagery from Google Earth. A higher ground factor of 1.0 was defined for more

absorptive ground, such as vegetation and loose soil. Semi-hard materials such as gravel and sand were assumed to have a ground absorption coefficient of 0.6.

- The project was assumed to operate 24 hours per day, so the average noise output would be essentially constant regardless of time of day. The noise attenuation model was set up to represent worst-case noise conditions.

5.3.4 *Operational Noise Impacts*

Calculations were performed using linear octave band power levels as inputs from each noise source. Summaries of the sound propagation model results are presented in the following sections.

5.3.4.1 SOUND LEVELS AT THE NEAREST RECEPTORS

The acoustic model calculated the sound propagation from the project site to the surrounding area based on the sound levels listed in Table 11. The noise impact of the project at the closest noise receptors as described in Section 4.2 is presented in this section.

The predicted sound levels at each evaluated receptor are shown in Table 12. As shown in Table 7, the existing noise levels at the analyzed receptors are over EPA's recommended 55 dBA L_{dn} level. The proposed project is expected to emit operational sound levels that are below existing background sound levels.

Table 12. Estimated Sound Levels

Receptor	Predicted Sound Levels from Project		Measured Background Noise		Cumulative Noise Levels		Potential Noise Increase	
	L_{eq}	L_{dn}	L_{eq}	L_{dn}	L_{eq}	L_{dn}	L_{eq}	L_{dn}
	dBA	dBA	dBA	dBA	dBA	dBA	dBA	dBA
5310 N Vail Road	53.3	59.7	51.5	60.5	55.5	63.1	4.0	2.6
4490 N Vail Road	46.5	52.9	51.5	60.5	52.7	61.2	1.2	0.7
134 W Randolph Road	39.6	46.0	48.2	55.2	48.8	55.7	0.6	0.5
4103 N Kennedy Street	46.4	52.8	48.2	55.2	50.4	57.2	2.2	2.0
3975 N Kennedy Street	46.5	52.9	48.2	55.2	50.4	57.2	2.2	2.0
5177 E Malcolm X Street	47.2	53.6	48.2	55.2	50.7	57.5	2.5	2.3
3766 E Newman Street	47.1	53.5	48.2	55.2	50.7	57.4	2.5	2.2
E Bell Street and Hudges Street	46.7	53.1	48.2	55.2	50.5	57.3	2.3	2.1
5160 E Kleck Road	46.2	52.6	48.2	55.2	50.3	57.1	2.1	1.9

The projected L_{dn} value at the closest sensitive receptor, a residence south of the project, is estimated to be 63.1 dBA when background noise is added, which is above the recommended 24-hour average day and night value of 55 dBA L_{dn}. It is important to note that noise generated from power plant equipment during normal operation is exempt from the noise limits described in Pinal County Ordinance 050306-ENO Section 7.

Regarding the human perception for change in sound level (i.e., potential increase above ambient), is estimated as 2.6 dBA, perceived by the human ear as barely noticeable. Therefore, the proposed operation would not result in a substantial permanent increase in ambient noise levels in the vicinity of the project.

A contour (isopleth) grid map was generated by SoundPLAN software and is presented in Appendix C. The map depicts the extent of noise propagation from the SoundPLAN models that were developed for the noise impact assessment. The noise contour maps illustrate the extent of noise associated with the proposed development. It is important to note that the extent of the impacts depicted in these figures does not include the contribution of the existing background noise.

5.3.5 *Corona Noise*

Operation noise outputs of transmission lines are minimal and generally limited to corona noise and the occasional maintenance vehicle surveying the transmission line. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware because of very high electric field strength at the surface of the metal during certain conditions.

Corona generates audible noise during operation of high-voltage transmission lines. Under certain conditions, the localized electric field near an energized conductor can be sufficiently concentrated to produce a tiny electric discharge that can ionize air close to the conductors. This partial discharge of electrical energy is called corona discharge, or corona. Several factors, including conductor voltage, shape, diameter, and surface irregularities such as scratches, nicks, dust, or water drops, can affect a conductor's electrical surface gradient and its corona performance. Corona is the physical manifestation of energy loss and can transform discharge energy into very small amounts of sound, heat, and chemical reactions of the air components.

Audible noise from the line can barely be heard in fair weather conditions on higher voltage lines. During wet weather conditions (such as rain or fog), water drops collect on the conductor and increase corona activity so that a crackling or humming sound may be heard near the line. This noise is caused by small electrical discharges from the water drops. However, during heavy rain, the ambient noise generated by the falling raindrops will typically be greater than the noise generated by corona.

5.3.6 *Communication Interference*

Transmission line corona effects associated with the proposed project could interfere with amplitude modulation (AM) radios in vehicles, but only when those vehicles travel under or near the line. Additionally, only AM receivers located very near to transmission lines that are tuned to a weak station have the potential to be affected by radio interference. AM radio frequency interference typically dissipates rapidly with increasing distance from the line. Frequency modulation (FM) radio is rarely affected by corona because corona-generated radio frequency noise currents decrease in magnitude with increasing frequency.

Television reception in local homes is not expected to change as a result of the proposed project. The closest residential receptor is located approximately 465 feet west of the proposed transmission line, and all residences within 1 mile of the route are closer to the existing 500-kV transmission lines than they would be to the proposed project. It is logical to assume that if residents at any of these locations are not currently experiencing interference from the existing lines, they will not experience interference from the more distant line.

Rural residents are more likely to be receiving television by satellite than broadcast in any case. Satellite television frequencies are higher than transmission line frequencies and are not affected by transmission line operation or corona. Cable television service is equally unaffected.

Similarly, wireless computer networks such as Wi-Fi or wireless local area networks operate at high frequencies in the tens to hundreds of megahertz (MHz) or gigahertz (GHz) and use digital coding of the signals. As a result of the high frequencies used by these devices, modulation and processing techniques, effects from interference are unlikely.

Transmission lines do not interfere with cellular phone tower operations or microwave communication paths. This is demonstrated by the fact that cellular phone antennae and microwave receivers are commonly mounted on transmission structures receive the benefits of the additional height provided by the structures.

6 LITERATURE CITED

American National Standards Institute (ANSI). 2013. *Quantities and Procedures for Description and Measurements with an Observer Present – Part 3: Short-term Measurements with an Observer Present, ANSI/ASA S12.9-2013/Part 3.* American National Standards Institute, Inc.

American Society for Testing and Materials (ASTM). 2012. *E1014-12, Standard Guide for Measurement of Outdoor A-Weighted Noise levels*. West Conshohocken, Pennsylvania: American Society for Testing and Materials International.

ATCO. 2008. *Noise Impact Assessment, Coolidge Generating Station, Coolidge, Arizona.* ATCO. June.

Beranek, L.L. (ed.). 1988. *Noise and Vibration Control*. Washington, D.C.: Institute of Noise Control Engineering

Bolt Beranek and Newman, Inc. 1973. *Fundamentals and Abatement of Highway Traffic Noise*. Report Number PB-222-703. Prepared for U.S. Department of Transportation, Federal Highway Administration. Bolt Beranek and Newman, Inc.

Federal Highway Administration (FHWA). 2011. Roadway Construction Noise Model (RCNM). Software Version 1.1. Federal Highway Administration.

Pinal County. 2011. Municipal Ordinance No. 050306-ENO: Regulation of Excessive Noises.

U.S. Climate Data. 2021. *Climate Coolidge – Arizona*. Available at: https://www.usclimatedata.com/climate/coolidge/arizona/united-states/usca0332. Accessed November 18, 2021.

U.S. Environmental Protection Agency (EPA). 1979. Protective Noise Levels, Condensed Version of EPA Levels Document. Available at: http://www.nonoise.org/library/levels/levels.htm.

APPENDIX A

Long-Term Monitoring Location Photographs

Photo A-1. Monitoring Location LT-1.

Photo A-2. Monitoring Location LT-2.

APPENDIX B

Daily Field Data Sheets

Baseline Noise Survey
LT-1 Monitoring Locations

Location: LT-1

Coordinates	Lat:	32 54'45" N				
	Lon:	111 30'32"W				
	Elevation (ft):	940				
Sound Meter	Model :	LD 831C		**Preamplifier**	Model :	PRM831
	S/N:	0010739			S/N:	58504
Microphone	Model :	377B02				
	S/N:	311602				
Monitoring	Start Time:	12.33		**Calibrations**	Pre-Test:	-0.04
	End Time:	2:19			Stop	0.03
					Post-Test:	-0.03

Location Description
West property boundary

Parameter	Value
Duration hh:mm	48:38:00
Memory	99%
Overall Laeq	48.20

Log:

Event	Day	Time	Comment (Dominant Background Noise Source)
			Quiet agricultural setting.

APPENDIX C

Project Operation Isopleths

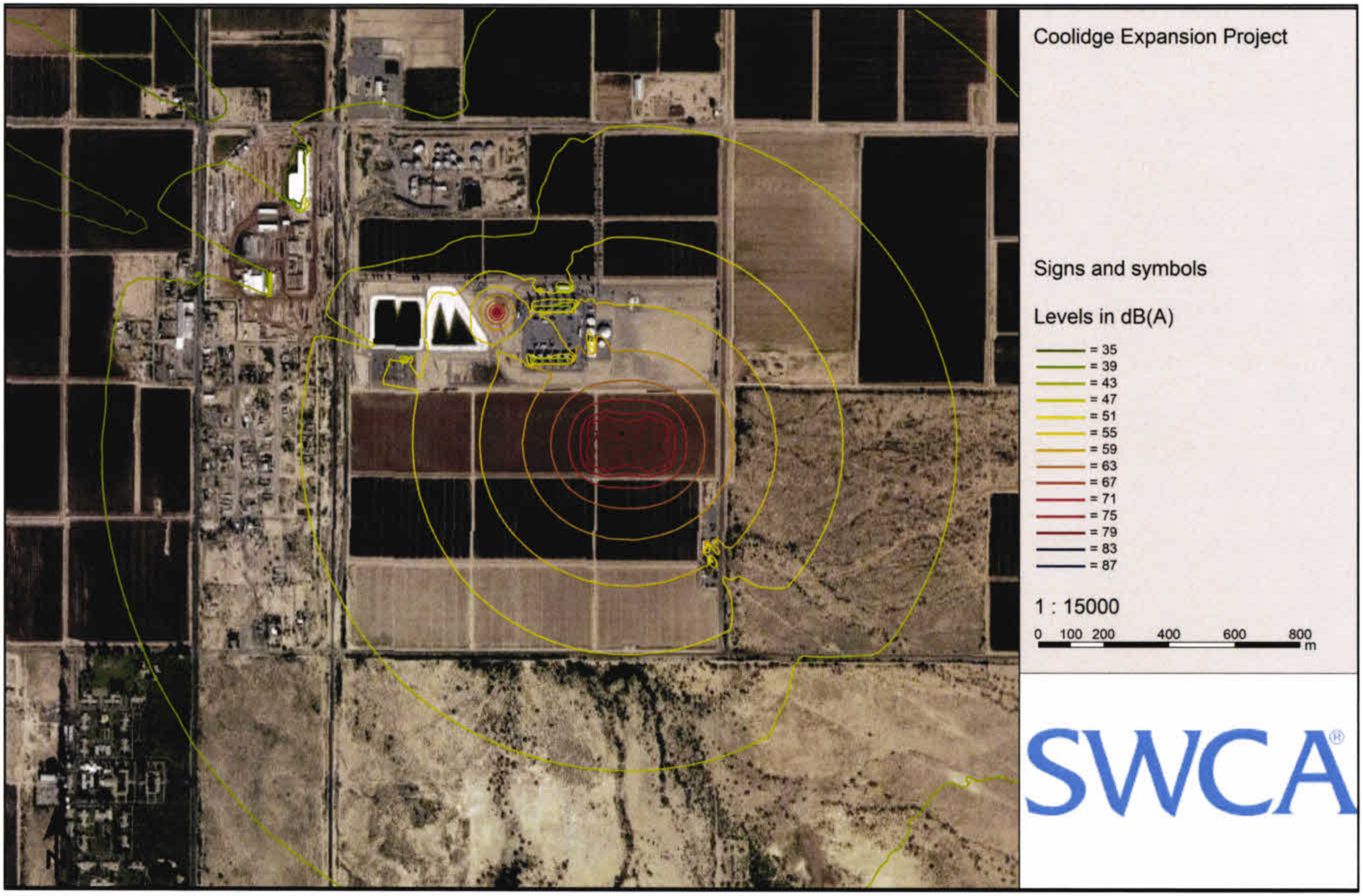

Figure C-1. Project operation noise isopleth.

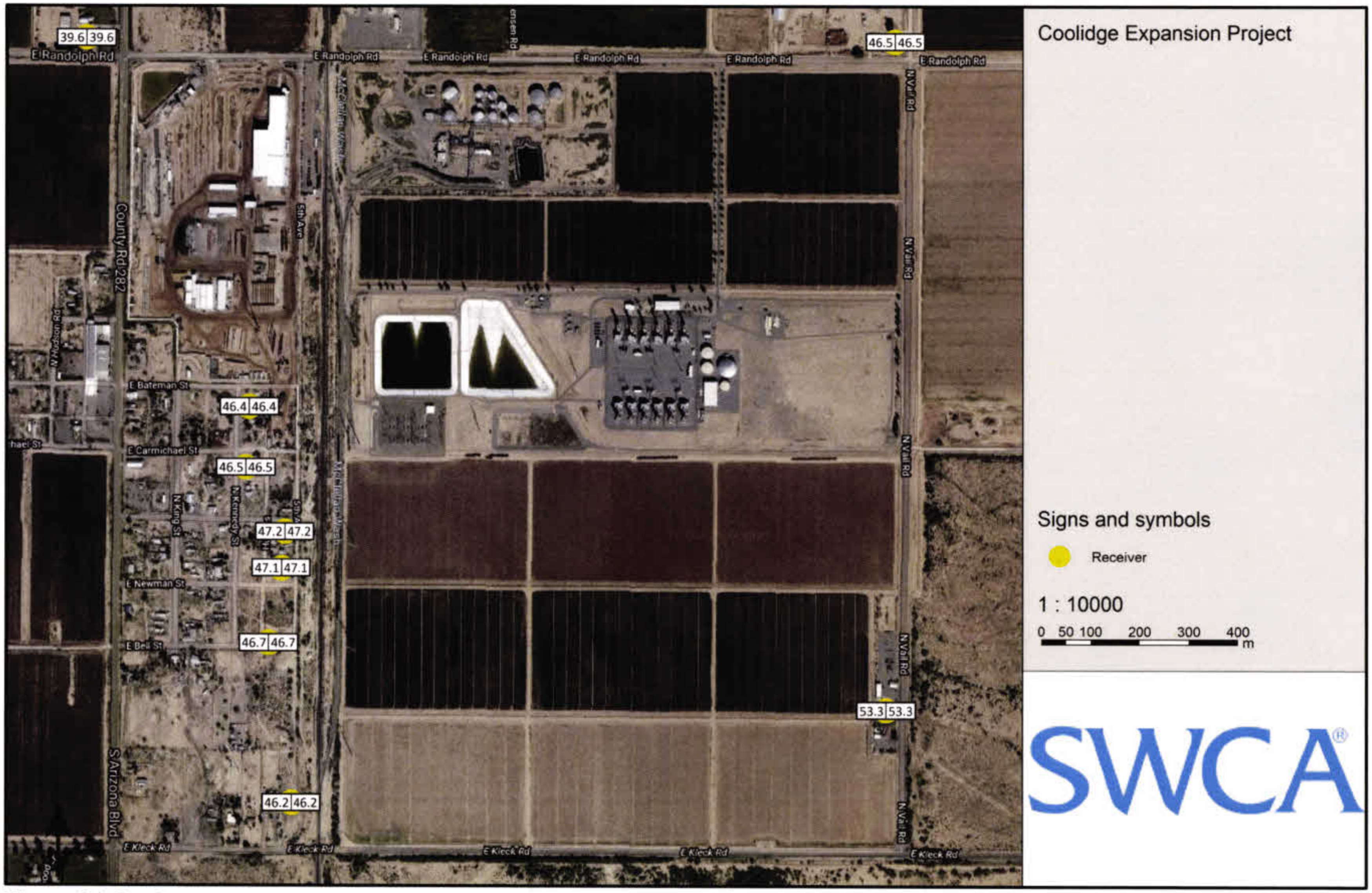

Figure C-2. Project operation noise – single point map.

EXHIBIT J – SPECIAL FACTORS

As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219: Describe any special factors not previously covered herein, which applicant believes to be relevant to an informed decision on its application.

Introduction

This exhibit includes information on the public and agency involvement program that has been conducted for the Project. The outreach efforts provided information to members of the public and agencies, solicited feedback on the Project, and were designed to help identify potential issues relative to the Project.

Public Involvement Program Summary

The public involvement program was conducted to ensure that local jurisdictions, relevant agencies, and community residents or property owners were provided with the opportunity to receive and relay information.

To contact the potentially affected residents and agencies, SRP developed and held multiple public participation measures and activities, including informational letters, a Project website, Facebook/Instagram/Nextdoor social media ads, newspaper advertisements, a telephone information line, in-person and virtual open houses, and focused outreach (door-to-door communication).

Informational Letters

SRP hand-delivered an invitation to the October 16, 2021, community event (see Open Houses, below) to residents in the Randolph community. A copy of this invitation is shown in Exhibit J-1a.

SRP also sent three public notifications to all property owners and residents within 7 miles of the Project as part of the CEC public involvement process. The first informational notice was mailed on August 31, 2021, and included an introduction to the Project and Coolidge Generating Station facility and announced the virtual open house. The second notification was sent on October 7, 2021, to announce details about the four live online open houses and first in-person open house. The third notification was sent on November 17, 2021, to announce details about the second in-person open house. These notifications are shown in Exhibits J-1b, J-1c, and J1-d.

Website and Social Media

The Project website srpnet.com/cep was created as a central location to provide stakeholders and interested parties with updates, general Project information, and opportunities for public comment. The website also included Project information in videos, maps, and frequently asked questions (FAQs). Interested parties were able to visit and review materials at their convenience and submit comments and questions through an embedded comment form. A copy of the website content is shown in Exhibits J-2a through J-2f, including a copy of the electronic comment form. The Project website was also made available in Spanish. An example of the Spanish website content is shown in Exhibit J-2g.

Facebook, Instagram, and Nextdoor were used to reach additional interested parties and announce the virtual open house, live online open house events, and the in-person open houses. Advertisements for the virtual open house were run on Facebook in English, and in Spanish, from September 23 to 30, 2021. Advertisements for the live online open house events were run on these social media platforms in English, and in Spanish on Facebook and Instagram, from October 13 to 20, 2021. Advertisements for the in-person open houses were run in English on these social media platforms, and in Spanish on Facebook and Instagram, from October 26 to November 2, 2021, and on December 1 to December 9. A copy of the advertisements is shown in Exhibits J-3a and J-3c.

Media Relations

SRP placed advertisements in the *Coolidge Examiner/Casa Grande Dispatch* on October 27, 2021, and December 1, to announce the in-person open houses held at the Pinal County Fairgrounds and Artisan Village respectively, and to provide general information about the Project and additional opportunities for comment through the telephone information line and the Project website.

A copy of the advertisements placed in the *Coolidge Examiner/Casa Grande Dispatch* is included in Exhibit J-4.

Telephone Line

SRP provided additional opportunity for members of the public to leave comments or questions by creating a telephone information line. The telephone number was provided in the informational notices, Project website, and newspaper advertisement. The telephone line informed callers about where to find Project information online and invited questions and comments. All voice messages requesting further information were returned within approximately 24 hours by a Project team member, unless they were received on a weekend or holiday.

Agency and Local Official Briefings

Throughout the Project process, team members held meetings with local jurisdiction and agency representatives, including elected officials and planning staff, and others to relay information about the Project, answer questions, and request feedback. These meetings enabled the Project team to identify stakeholder issues and relay information about developments in the Project. Agency and other stakeholder meetings are included in Table J-1.

Community Event and Open Houses

SRP hosted a 2-hour community event on October 16, 2021, at the New Life Christian Center in Randolph, Arizona. The event included information about the Project, lunch and beverages for attendees, and an activity for children. The project handout provided at the community event is included as Exhibit J-5.

SRP hosted four 1-hour live online open houses to provide stakeholders and interested parties with Project information and the opportunity to ask questions about the Project. The live online open houses were held on October 20 and 21, 2021. Each day included an afternoon and evening session. Each session included a presentation with information about the Project and the CEC process, and time for attendees to ask questions of the Project team. The presentation is shown in Exhibit J-6.

SRP also hosted two 2-hour, in-person open houses on November 3, 2021, at the Pinal County Fairgrounds and on December 9, 2021, at the Artisan Village in Coolidge, Arizona. Each event included posters with information about the Project and the CEC process and an opportunity for attendees to ask questions of the Project team and submit written comments. The posters are included as Exhibit J-7a. The project handout provided at the in-person open house is included as Exhibit J-7b.

Public Comment

Throughout the public involvement program, comments from the public were solicited and considered in the planning process. As part of the public involvement program, comments from multiple individuals, agencies, or jurisdiction representatives were received. Comments were submitted either by written comment form, by email or voicemail, or made verbally during meetings and briefings. All requests for response or additional information were addressed by a Project team member.

Most of the comments received were questions about the location and look of the Project, along with questions about the Project need and how the Project may impact health, safety, and accessibility within the region.

A listing of stakeholder interactions is presented in Table J-1.

Table J-1. Project Stakeholder Interaction Summary

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Anna Tovar	Commissioner	6/15/2021	Briefing	Regulatory Policy briefed Commissioner Tovar-future load needs
Jim O'Connor	Commissioner	6/16/2021	Briefing	Regulatory Policy briefed Commissioner O'Connor-future load needs
Justin Olson	Commissioner	6/16/2021	Briefing	Regulatory Policy briefed Commissioner Olson-future load needs
Lea Márquez-Peterson	Commissioner	6/16/2021	Briefing	Regulatory Policy briefed Chairwoman Márquez-Peterson
Casey Saxton	ED2	7/28/2021	Phone call outgoing	Outreach assistance
Lea Márquez-Peterson	Commissioner	8/10/2021	Briefing	Initial project briefing
Dan Schweibert	Chairwoman Lea Márquez Peterson	8/10/2021	Briefing	Initial project briefing
Madison Doyle	Chairwoman Lea Márquez Peterson	8/10/2021	Briefing	Initial project briefing
Justin Olson	Commissioner	8/10/2021	Briefing	Initial project briefing
Leo Lew	Pinal County Manager	8/10/2021	Briefing	Initial project briefing
Kevin Kavanagh	Pinal County Supervisor	8/10/2021	Briefing	Initial project briefing
Michael Clark	Commissioner Justin Olson	8/10/2021	Briefing	Initial project briefing
Nick Meyers	Commissioner Justin Olson	8/10/2021	Briefing	Initial project briefing
Jim O'Connor	Commissioner	8/11/2021	Briefing	Initial project briefing
Tom Broderick	Commissioner Jim O'Connor	8/11/2021	Briefing	Initial project briefing
Katherine White	Co-Pastor at The New Life Christian Center	8/11/2021	Phone call outgoing	Initial project briefing
Ray Peace	Pastor at The Church of Christ of Randolph	8/11/2021	Phone call outgoing	Initial project briefing
Melvin Moore	Randolph Resident	8/11/2021	Phone call outgoing	
Mary Peace	Married to Pastor Ray Peace	8/11/2021	Text Message	Providing contact information

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Buchanan Davis	Governor Ducey's office	8/12/2021	Briefing	Initial project briefing
Jordy Fuentes	House Majority Staff	8/12/2021	Briefing	Project briefing in-person Jordy Fuentes, Policy Advisor House Majority Staff Alan Eder, Megan Martin
David Cook	Arizona House of Representatives	8/12/2021	Briefing	Project briefing (zoom) Rep. David Cook, Legislative District 8 Alan Eder, Megan Martin & Jason Baran (SRP)
Jon Thompson	Mayor of the City of Coolidge	8/12/2021	Briefing	Initial project briefing
Vicente Reyna	Senate Minority Staff	8/12/2021	Briefing	Zoom Briefing Vicente Reyna, Policy Advisor, Senate Minority Staff Alan Eder, Megan Martin and Jason Baran- Initial project briefing
Zach Branum	ACC Staff	8/12/2021	Briefing	Teams Briefing ACC Staff – Zach Branum, Briton Baxter, Renelle Palladino David Felix, Manny Tarango- Initial project briefing
Briton Baxter	ACC Staff	8/12/2021	Briefing	Teams Briefing ACC Staff – Zach Branum, Briton Baxter, Renelle Palladino, David Felix, Manny Tarango- Initial project briefing
Ranelle Palladino	ACC Staff	8/12/2021	Briefing	Teams Briefing ACC Staff – Zach Branum, Briton Baxter, Renelle Palladino, David Felix, Manny Tarango- Initial project briefing
Anna Tovar	Commissioner	8/13/2021	Briefing	Initial project briefing
Jeff Jordan	Randolph Resident	8/17/2021	Phone call outgoing	Initial project briefing
Mary Turner	Randolph Resident	8/17/2021	Phone call outgoing	Initial project briefing
TJ Shope	Senator R-Coolidge	8/17/2021	Briefing	M. Martin and J. Baran briefed Senator Shope- Initial project briefing
Sine Kerr	Legislative District 13 R-Buckeye	8/17/2021	Briefing	M. Martin and J. Baran briefed Senator Kerr- Initial project briefing
Buchanan Davis	Governor Ducey's office	8/18/2021	Briefing	M. Martin & J. Baran briefed B. Davis- initial project- Initial project briefing
Anna Tovar	Commissioner	8/19/2021	Briefing	Initial project briefing
Mary Turner	Randolph Resident y	8/20/2021	Phone call outgoing	Randolph partnership ideas
Casey Saxton	ED2	8/24/2021	Email outgoing	Initial project briefing
Jeff Jordan	Randolph Resident	8/24/2021	Email outgoing	Provided project website

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Katherine White	Co-Pastor at The New Life Christian Center	8/24/2021	Email outgoing	Provided project website
Ray Peace	Pastor at The Church of Christ of Randolph	8/24/2021	Phone call outgoing	Project update
Eric Daniels	City of Coolidge Councilmember	8/25/2021	Briefing	Initial project briefing
Rick Miller	Coolidge City Manager	8/25/2021	Briefing	Initial project briefing
Tatiana Murrieta	City of Coolidge Councilmember	8/25/2021	Briefing	Initial project briefing
Benjamin Navarro	City of Coolidge Councilmember	8/27/2021	Briefing	Initial project briefing
Jacque Hendrie	City of Coolidge Councilmember	8/27/2021	Briefing	Initial project briefing
Gilbert Lopez	City of Coolidge Development Services Director	8/27/2021	Briefing	Initial project briefing
Candice Hughes	Member of the public	8/30/2021	Phone call incoming	Ms. Hughes called SRP Corporate Secretary's office- opposes the project
Jeff Jordan	Randolph Resident	8/30/2021	Phone call outgoing	Confirmed Jeff received the email with the project website.
Katherine White	Co-Pastor at The New Life Christian Center	8/30/2021	Phone call outgoing	Left voice message to confirm Katherine received the email with the project website
Mary Turner	Randolph Resident	9/3/2021	Phone call outgoing	Randolph event ideas
Ray Peace	Pastor at The Church of Christ of Randolph	9/3/2021	Phone call outgoing	Randolph event ideas
Josh Steed	Member of the public	9/4/2021	Web Site Comment	Interested in SRP providing service to the City of Coolidge
Victoria Moore	Member of the public	9/8/2021	Phone call incoming	Interested in rooftop solar and wanted to know if this project would raise her rates with APS and SW Gas.

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Blake Sacha	Member of the public	9/8/2021	Web Site Comment	I am an SRP customer, and I oppose this expansion. We shouldn't be buying natural gas from outside of our state when we have plenty of our own sunshine. There are better options to satisfy peak demand including providing incentives to homeowners to reduce peak demand and adding solar generation and storage capacity. If we are going to make an impact on climate change, we must stop investing in fossil fuel burning technology.
Katherine White	Co-Pastor at The New Life Christian Center	9/13/2021	Email Incoming	Randolph event planning
Kevin Kanaat	Member of the public	9/13/2021	Web Site Comment	Inquired if a ratepayer impact analysis was done during the proposal? Why SRP did not release a technology neutral, competitive bid and let the free market offer up solutions? What the planned CO2 and methane emissions of the plant over its projected lifespan were?
Bob McCaskey	Western Emulsions	9/14/2021	Email outgoing	Initial project briefing
Les McCauley	Stinger Bridge & Iron	9/14/2021	Meeting	Initial project briefing
Matt McCormick	Pinal Land Holdings & Saint Holdings & Coolidge Chamber of Commerce	9/14/2021	Briefing	Initial project briefing
Rhonda (last name not provided)	Member of the public	9/14/2021	Phone call incoming	Opposes the project
Scott Casler	Hummel Engine & Machining LLC	9/14/2021	Meeting	Initial project briefing
Tonia Schultz	Arizona Training Program	9/14/2021	Meeting	Initial project briefing
Jeff Jordan	Randolph Resident	9/15/2021	Phone call outgoing	Project update

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Sandra Kennedy	Commissioner	9/15/2021	Briefing	Initial project briefing
Jannine Mathis	Member of the Public	9/16/2021	Web Site Comment	Please review other energy options for the extra electricity needed. Wind and solar are not experimental and they are competitive in price.
Sylvia Dickinson	Member of the Public	9/22/2021	Web Site Comment	Inquired to find out how the proposed Coolidge Expansion Project will affect family's land
Estella Dun	Randolph Resident	9/24/2021	Phone call incoming	Estella had basic project questions. SWCA informed her on the open house options coming soon and the Randolph event. Estella asked if we were doing any studies because she has heard about cancer clusters near power plants. Advised that we will be doing studies including, biological, cultural, ground water.
Katherine White	Co-Pastor at The New Life Christian Center	9/27/2021	Email outgoing	Randolph partnership ideas
Mary Turner	Randolph Resident	9/27/2021	Phone call outgoing	Health concerns
Ray Peace	Pastor at The Church of Christ of Randolph	9/27/2021	Phone call outgoing	Gas pipeline concerns
Jeff Jordan	Randolph Resident	9/29/2021	Text Message	Randolph partnership ideas
Jasmine Moore-Reece	Randolph Resident	9/30/2021	Phone call outgoing	Initial project briefing
Jeff Jordan	Randolph Resident	9/30/2021	Phone call incoming	Jeff Jordan called C. Hallows
Kyle Muldrow	Randolph Resident	10/1/2021	Meeting	Randolph partnership ideas
Mary Turner	Randolph Resident	10/1/2021	Meeting	Opposes the project
Matt McCormick	Pinal Land Holdings & Saint Holdings & Coolidge Chamber of Commerce	10/1/2021	Email Incoming	Mr. McCormick inquired if SRP can share a site plan and any elevation/renderings so he could understand exactly what will be adjacent to his property to the south of the Project. Mr. McCormick also had additional questions about project specific information.
Autumn Johnson	Member of the public	10/1/2021	Web Site Comment	SRP should NOT move forward with this Coolidge Expansion Project without a meaningful stakeholder process and a formal RFP. There is simply not enough information for them to move forward with such a massive investment in such a dated technology that does not acknowledge the clean energy transition. SRP also needs to update its carbon goals to a mass based standard. An intensity goal is meaningless.

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Amish Shah	Legislative District 24	10/6/2021	Briefing	Initial project briefing
Bob McCaskey	Western Emulsions	10/7/2021	Email outgoing	Open house invite
Les McCauley	Stinger Bridge & Iron	10/7/2021	Email outgoing	Open house invite
Tonia Schultz	Arizona Training Program	10/7/2021	Email outgoing	Open house invite
Matt McCormick	Pinal Land Holdings & Saint Holdings & Coolidge Chamber of Commerce	10/7/2021	Email outgoing	Open house invite
Ray Peace	Pastor at The Church of Christ of Randolph	10/7/2021	Email outgoing	Open house invite
Kyle Muldrow	Randolph Resident	10/7/2021	Email outgoing	Open house invite
Mary Turner	Randolph Resident	10/7/2021	Email outgoing	Open house invite
Katherine White	R Randolph Resident	10/7/2021	Email outgoing	Open house invite
Ray Peace	Pastor at The Church of Christ of Randolph	10/7/2021	Phone call outgoing	Randolph partnership ideas
Jeff Jordan	Randolph Resident	10/7/2021	Email outgoing	Open house invite
Paul Klussman	Member of the Public	10/11/2021	Phone call incoming	Wanted to know more about the project and how it will affect this property.
Gabrielle Lawrence	Member of the public	10/28/2021	Phone call incoming	Called in to express her opinion about the expansion of the gas plant in Coolidge. Gabrielle is not in favor of the project and thinks we should be building solar and wind farms, instead of expanding our methane gas into the atmosphere. She does not believe we need any more expansions on gas and that money needs to be put towards solar, wind, or whatever is going to help us instead of expanding gas. Gabrielle provided information about the coal debt securitization plan, that helps fuel plants that have external debts to pay those off while expanding solar at the same time. This information can be found on the "Matter of Degrees" podcast. Gabrielle does not support expansion of any fossil fuel plants at this point and believes we need to put all of our energy into sustainability here in Arizona specifically.
Richard Sigler	Member of the public	10/15/2021	Web Site Comment	I would like to know more about this project. With renewables now cheaper than fossil fuels, why are we putting money into this project?

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Jeff Jordan	Randolph Community	10/16/2021	Text message outgoing	
Randolph Community Event		10/16/2021	Community event	
Katherine White	Randolph Resident	10/22/2021	Mail outgoing	Thank you
Mary Turner	Randolph Resident	10/22/2021	Mail outgoing	Thank you
Rick Miller	Coolidge City Manager	10/25/2021	Briefing	Project Update
Eric Veras	Member of the public	10/26/2021	Phone call incoming	Eric calling on behalf of his sister regarding her property. Interested in selling to a solar project.
Jakob Andersen	Saint Holdings LLC	10/26/2021	Meeting	Initial project briefing
Matt McCormick	Pinal Land Holdings & Saint Holdings & Coolidge Chamber of Commerce	10/26/2021	Meeting	Project Update
Gabrielle Lawrence	Member of the public	10/11/2021	Web Site Comment	I am not in favor of the expansion of the Coolidge gas plant. I would like us to spend any expansion money on sustainable technologies such as solar and wind.
Stacey Champion	Member of the public	10/29/2021	Email Incoming	What agencies (state and federal) you need to seek approval from for this expansion, as well as what/if any environmental impacts/studies/data has been collected for this project?
Stacey Champion	Member of the public	10/29/2021	Web Site Comment	Inquired to find out if an Environmental Impact Statement (EIS) had been completed for the project and if so where it is publicly located.
Ben Heglie	Land Advisors, part owner of parcels 40133002B &A	11/2/2021	Phone call outgoing	Initial project briefing
Ray Peace	Pastor at The Church of Christ of Randolph	11/4/2021	Phone call incoming	Pastor Peace called C. Hallows
Ron Jordan	Randolph Resident	11/4/2021	Phone call incoming	Ron expressed concern with how Randolph will benefit from this expensive expansion.
Rick Miller	Coolidge City Manager	11/5/2021	Phone call outgoing	Discussed possible locations for a second in-person open house.
Jacob Beach	Solar Contractor	11/9/2021	Phone call incoming	Jacob stated he is a solar contractor who works in Coolidge. Asked general questions.

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Marta Darby	Member of the public	11/9/2021	Web Site Comment	Inquired about the E3 study mentioned in the FAQ's for the project.
Cheri Boucher	Arizona Game and Fish Department	11/10/2021	Email Incoming	Burrowing owl concern (letter provided in Exhibit C-3)
Lea Márquez-Peterson	Commissioner	11/15/2021	Briefing	Project Update
Mary Turner	Randolph Resident	11/15/2021	Email incoming	Budget Question
Mary Turner	Randolph Resident	11/15/2021	Phone call outgoing	Project Update
Katherine White	Co-Pastor at The New Life Christian Center	11/15/2021	Phone call outgoing	Randolph partnership ideas
Ron Jordan	Randolph Resident	11/15/2021	Phone call incoming	Open house invite
Kyle Muldrow	Randolph Resident	11/15/2021	Phone call outgoing	Project update
Ray Peace	Pastor at The Church of Christ of Randolph	11/15/2021	Phone call incoming	Open house invite
Jeff Jordan	Randolph Resident	11/15/2021	Phone call incoming	Open house invite
Ben Heglie	Land Advisors, part owner of parcels 40133002B &A	11/15/2021	Phone call incoming	Open house invite
Matt McCormick	Pinal Land Holdings & Saint Holdings & Coolidge Chamber of Commerce	11/15/2021	Phone call incoming	Open house invite
Tonia Schultz	Arizona Training Program	11/15/2021	Phone call incoming	Open house invite
Les McCauley	Stinger Bridge & Iron	11/15/2021	Phone call incoming	Open house invite
Bob McCaskey	Western Emulsions	11/15/2021	Phone call incoming	Open house invite
Jeff Jordan	Randolph Resident	11/15/2021	Phone call incoming	Opposes the project
Jim O'Connor	Commissioner	11/16/2021	Briefing	Project update
Sandra Kennedy	Commissioner	11/16/2021	Briefing	Project update
Jeff Jordan	Randolph Resident	11/16/2021	Text message	Budget question
Jeff Jordan	Randolph Resident	11/17/2021	Text message	Question about when SRP purchased the Coolidge Generating Station.

Name	Affiliation	Interaction Date	Interaction Type (email, telephone hotline, postal mail, briefing)	Summary of Public Comment/Question
Ryan Bentz	Member of the public	11/17/2021	Website Comment	Question about the turbines being installed for the project.
Ryan Bentz	Member of the public	11/17/2021	Website Comment	Additional turbine question.
Nathan Miller	Member of the public	11/22/2021	Website Comment	Contractor
Kyle Muldrow	Randolph Resident	11/24/2021	Email outgoing	Randolph partnership ideas
Anna Tovar	Commissioner	11/29/2021	Briefing	Project update
Neal Carter	AZ House of Representatives Legislative District 8	12/2/2021	Email outgoing	Open house invite
Jeff Jordan	Randolph Resident	12/6/2021	Meeting	Open house invite
Kyle Muldrow	Randolph Resident	12/6/2021	Phone call outgoing	Open house invite
Mary Turner	Randolph Resident	12/6/2021	Phone call outgoing	Open house invite

JOIN SRP FOR A COMMUNITY EVENT

SATURDAY, OCT. 16, 11 A.M.–1 P.M.

THE EVENT WILL BE HELD AT THE OLD LOCATION OF THE NEW LIFE CHRISTIAN CENTER ON AZ-87 AND BATEMAN STREET: 4883 E. BATEMAN ST., COOLIDGE, AZ 85128.

Free lunch and beverages will be provided.

Kids will enjoy a fun activity.

Information about SRP's Coolidge Expansion Project will be provided.

To learn more about the Coolidge Expansion Project, visit srpnet.com/CEP.

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165811-004 09/21

Exhibit J-1a. October 16th community event invitation.

ANNOUNCING THE COOLIDGE EXPANSION PROJECT

SRP is applying for a Certificate of Environmental Compatibility (CEC) for the expansion of the Coolidge Generating Station, a natural gas power plant near Coolidge, Arizona. The Coolidge Expansion Project (CEP) will allow SRP to meet the significant and increasing near-term energy needs in its service territory, which is among the fastest growing regions in the nation. In addition, the CEP will allow SRP to add more renewable resources while maintaining the reliability of the power grid.

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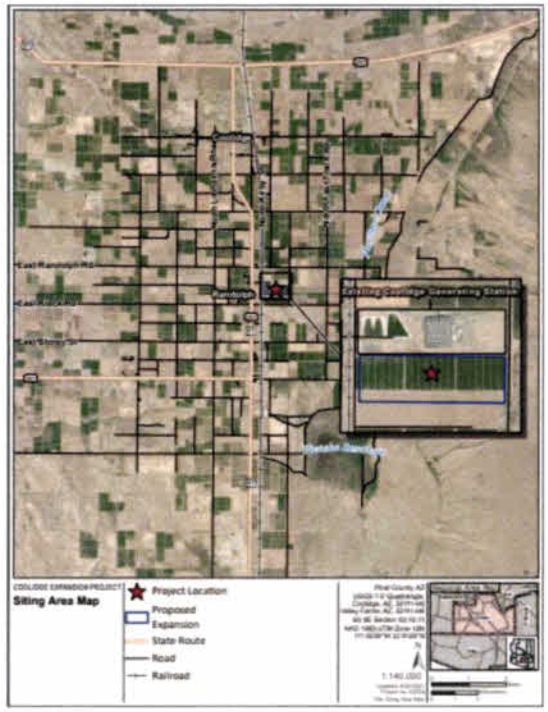

The CEP will be sited on approximately 100 acres adjacent to the existing Coolidge Generating Station, which is located southeast of the Arizona Boulevard and Randolph Road intersection. SRP will work with local stakeholders and surrounding communities to evaluate compatibility with existing power system infrastructure and land use.

To learn more about this project, visit **srpnet.com/cep** or call **(888) 705-1509**. **Para obtener información en español sobre este proyecto, visite srpnet.com/CEPspanish.**

SRP will be posting a virtual open house to the project webpage on Sept. 30, 2021. Once posted, the open house may be viewed on demand 24 hours a day at **srpnet.com/cep**.

SRP will also be hosting one or more in-person open houses (subject to CDC and local guidance) prior to filing the application for a CEC with the Arizona Corporation Commission. Dates and additional information for future open houses will be posted to the project website as they become available.

SRP

PAB4TB
P.O. Box 52025
Phoenix, AZ 85072-2025

PRSRT STD
U.S. POSTAGE
PAID
PHOENIX, AZ
PERMIT NO. 395

Exhibit J-1b. Project notification 1.

ANNOUNCING THE COOLIDGE EXPANSION PROJECT

LIVE OPEN HOUSES*

SRP is applying for a Certificate of Environmental Compatibility (CEC) for the expansion of the Coolidge Generating Station, a natural gas power plant near Coolidge, Arizona. The Coolidge Expansion Project (CEP) will allow SRP to meet the significant and increasing near-term energy needs in its service territory, which is among the fastest growing regions in the nation. In addition, the CEP will allow SRP to add more renewable resources while maintaining the reliability of the power grid.

*Subject to change based on COVID-19 health and safety protocols.

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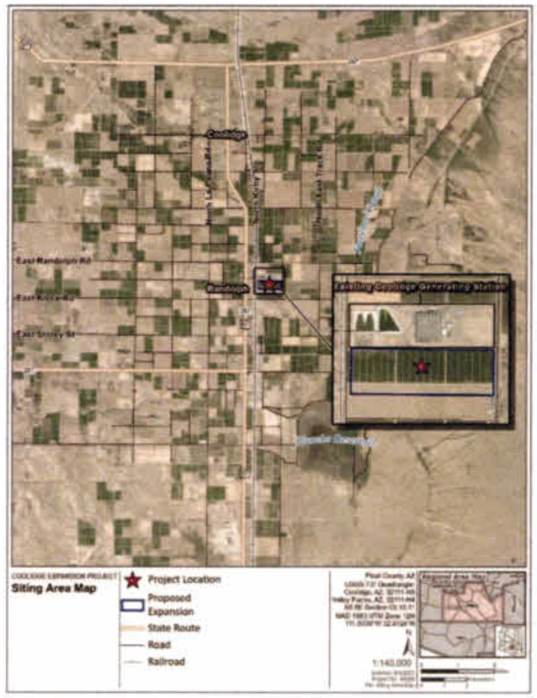

SRP has posted a virtual open house to the project webpage that can be viewed on demand 24 hours a day at **srpnet.com/CEP**.

In addition to the virtual open house, SRP has scheduled five opportunities to attend a live open house. The live open houses will provide project information and time to respond to questions.

LIVE ONLINE OPEN HOUSES

WEDNESDAY, OCT. 20, 2021,
Noon-1 p.m. or 5:30-6:30 p.m.

THURSDAY, OCT. 21, 2021,
Noon-1 p.m. or 5:30-6:30 p.m.

All attendees need to pre-register for the LIVE ONLINE event. Please visit **srpnet.com/CEP** for details and instructions. You can also call **(888) 705-1509**.

LIVE IN-PERSON OPEN HOUSE

Wednesday, Nov. 3, 2021, 4-6 p.m.
Final County Fairgrounds
512 S. Eleven Mile Corner Road, Casa Grande, AZ 85194

Masks are required, no pre-registration needed.

To learn more about this project, visit **srpnet.com/CEP** or call **(888) 705-1509**. Para obtener información en español sobre este proyecto, visite **srpnet.com/CEPspanish**.

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Exhibit J-1c. Project notification 2.

ANNOUNCING THE COOLIDGE EXPANSION PROJECT

IN-PERSON OPEN HOUSE*

SRP is applying for a Certificate of Environmental Compatibility (CEC) for the expansion of the Coolidge Generating Station, a natural gas power plant near Coolidge, Arizona. The Coolidge Expansion Project (CEP) will allow SRP to meet the significant and increasing near-term energy needs in its service territory, which is among the fastest growing regions in the nation. In addition, the CEP will allow SRP to add more renewable resources while maintaining the reliability of the power grid.

*Subject to change based on COVID-19 health and safety protocols

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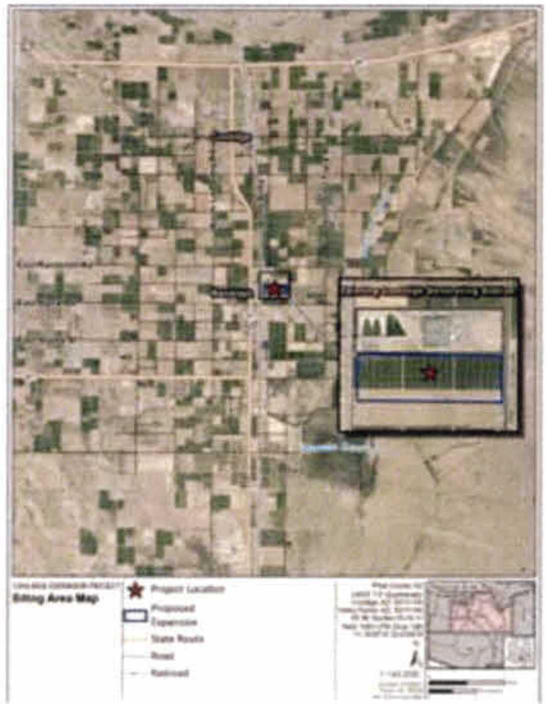

SRP has posted a virtual open house to the project webpage that can be viewed on demand 24 hours a day at **srpnet.com/CEP**.

SRP has scheduled another opportunity to attend a live open house. The in-person open house will provide project information and time to respond to questions.

LIVE IN-PERSON OPEN HOUSE

Thursday, Dec. 9, 2021, 5-7 p.m.
Artisan Village
351 N. Arizona Blvd., Coolidge, AZ 85128

Masks are required, no pre-registration needed

To learn more about this project, visit **srpnet.com/CEP** or call **(888) 705-1509**. Para obtener información en español sobre este proyecto, visite **srpnet.com/CEPspanish**.

PAB4TB
P.O. Box 52025
Phoenix, AZ 85072-2025

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PHOENIX, AZ
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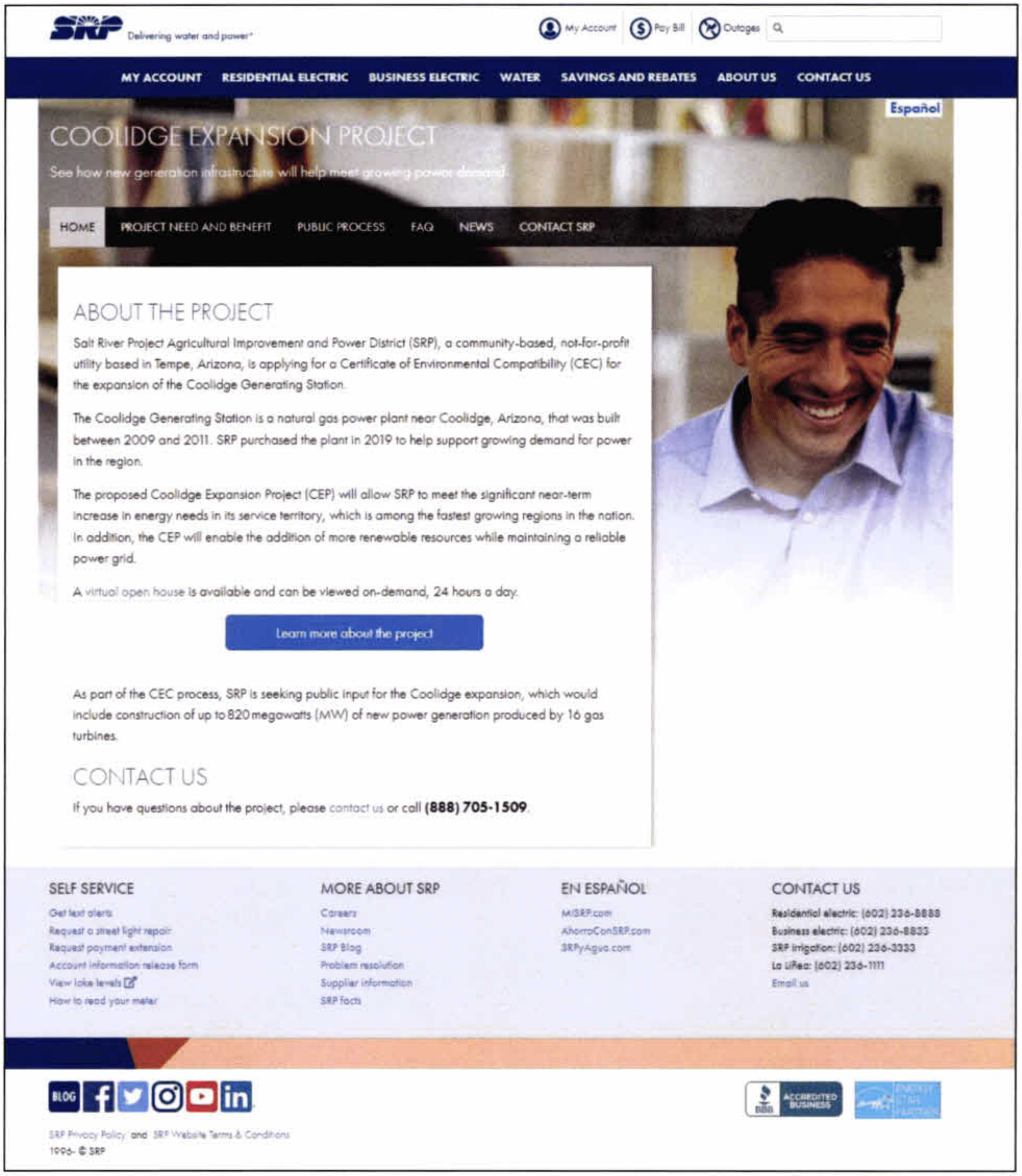
Exhibit J-1d. Project notification 3.



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COOLIDGE EXPANSION PROJECT

See how new generation infrastructure will help meet growing power demand.

HOME | PROJECT NEED AND BENEFIT | PUBLIC PROCESS | FAQ | NEWS | CONTACT SRP

ABOUT THE PROJECT

Salt River Project Agricultural Improvement and Power District (SRP), a community-based, not-for-profit utility based in Tempe, Arizona, is applying for a Certificate of Environmental Compatibility (CEC) for the expansion of the Coolidge Generating Station.

The Coolidge Generating Station is a natural gas power plant near Coolidge, Arizona, that was built between 2009 and 2011. SRP purchased the plant in 2019 to help support growing demand for power in the region.

The proposed Coolidge Expansion Project (CEP) will allow SRP to meet the significant near-term increase in energy needs in its service territory, which is among the fastest growing regions in the nation. In addition, the CEP will enable the addition of more renewable resources while maintaining a reliable power grid.

A virtual open house is available and can be viewed on-demand, 24 hours a day.

Learn more about the project

As part of the CEC process, SRP is seeking public input for the Coolidge expansion, which would include construction of up to 820 megawatts (MW) of new power generation produced by 16 gas turbines.

CONTACT US

If you have questions about the project, please contact us or call **(888) 705-1509**.

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Request payment extension
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EN ESPAÑOL

MiSRP.com
AhorraConSRP.com
SRPyAgua.com

CONTACT US

Residential electric: (602) 236-8888
Business electric: (602) 236-8833
SRP irrigation: (602) 236-3333
La Línea: (602) 236-1111
Email us

BLOG

SRP Privacy Policy and SRP Website Terms & Conditions
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Exhibit J-2a. Project website content.

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COOLIDGE EXPANSION PROJECT

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WHY IS THIS PROJECT NEEDED?

The proposed Coolidge Expansion Project (CEP) is needed to meet the significant near-term increase in energy needs in SRP's service territory, which is among the fastest growing regions in the nation. In addition, the CEP will enable the addition of more renewable resources while maintaining a reliable power grid. The CEP will ensure that SRP can meet these objectives while staying on the path to achieve our deep decarbonization goals over the long term.

WHAT BENEFIT DOES IT SERVE?

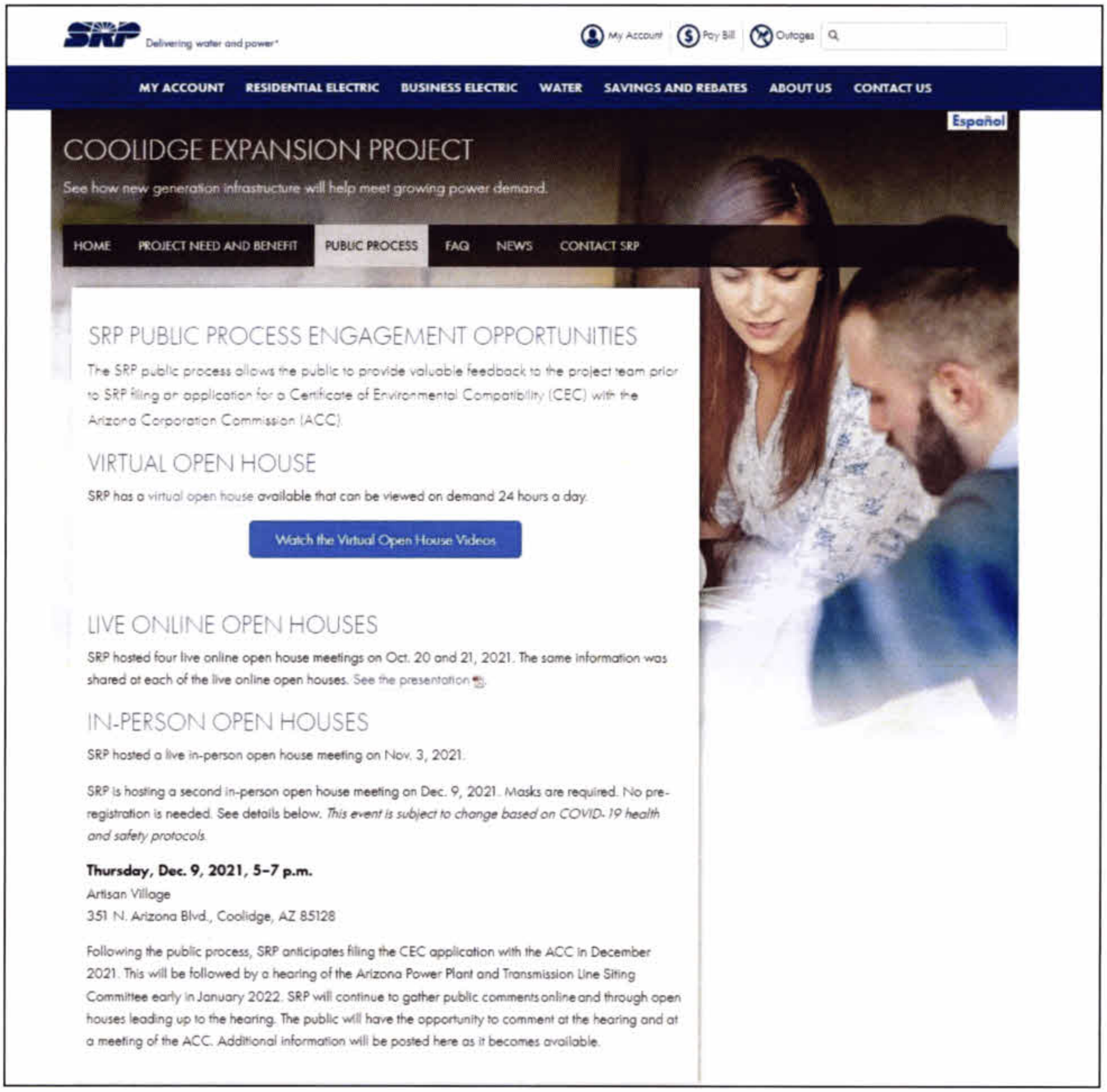
Benefits of CEP:

- **Meeting Near-term Demand:** One of SRP's primary responsibilities to the communities we serve is to provide reliable electric service. The CEP will allow SRP to fulfill this obligation in the face of strong economic growth in SRP's service territory.
- **Reliable Integration of Renewables:** SRP has committed to add 2,025 MW of solar energy to its renewable portfolio by 2025. Along with increased solar generation comes more variability in power output, especially during cloudy conditions. The CEP includes quick-starting (10 minutes) and fast-ramping power generation resources that can smooth out these fluctuations and ensure SRP delivers consistent, reliable power.
- **Importance of Location:** The CEP location allows SRP to leverage the existing Coolidge Generating Station site and infrastructure while also ensuring a better balance of power generation located in the East Valley with power generation located in the West Valley. This will help to optimize the overall power transfer capability, reliability and flexibility of SRP's transmission system.

PROPOSED EXPANSION SITE

EXISTING COOLIDGE GENERATING STATION

Exhibit J-2b. Project website content (continued).



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COOLIDGE EXPANSION PROJECT

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SRP PUBLIC PROCESS ENGAGEMENT OPPORTUNITIES

The SRP public process allows the public to provide valuable feedback to the project team prior to SRP filing an application for a Certificate of Environmental Compatibility (CEC) with the Arizona Corporation Commission (ACC).

VIRTUAL OPEN HOUSE

SRP has a virtual open house available that can be viewed on demand 24 hours a day.

Watch the Virtual Open House Videos

LIVE ONLINE OPEN HOUSES

SRP hosted four live online open house meetings on Oct. 20 and 21, 2021. The same information was shared at each of the live online open houses. See the presentation.

IN-PERSON OPEN HOUSES

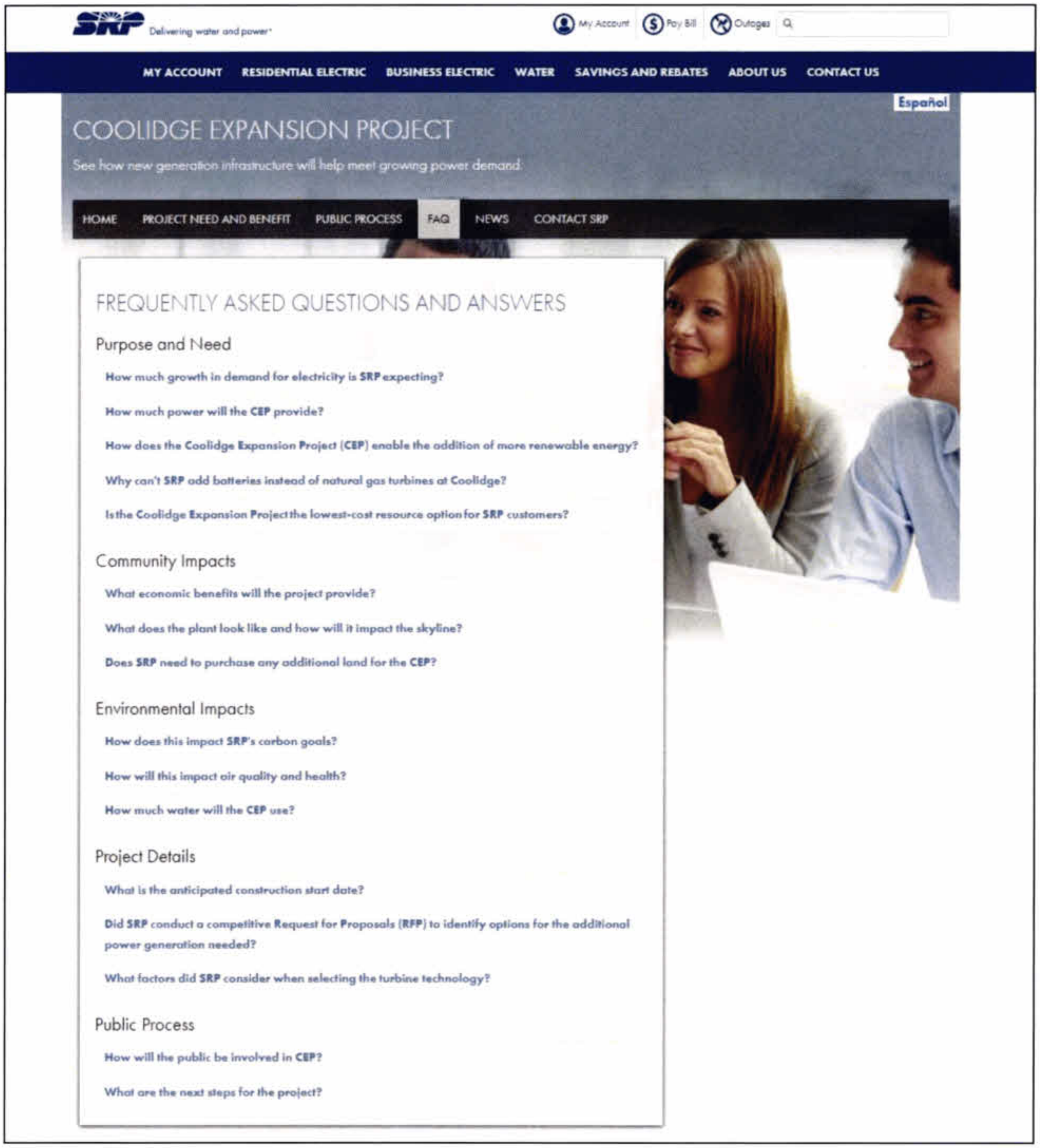
SRP hosted a live in-person open house meeting on Nov. 3, 2021.

SRP is hosting a second in-person open house meeting on Dec. 9, 2021. Masks are required. No pre-registration is needed. See details below. *This event is subject to change based on COVID-19 health and safety protocols.*

Thursday, Dec. 9, 2021, 5–7 p.m.
Artisan Village
351 N. Arizona Blvd., Coolidge, AZ 85128

Following the public process, SRP anticipates filing the CEC application with the ACC in December 2021. This will be followed by a hearing of the Arizona Power Plant and Transmission Line Siting Committee early in January 2022. SRP will continue to gather public comments online and through open houses leading up to the hearing. The public will have the opportunity to comment at the hearing and at a meeting of the ACC. Additional information will be posted here as it becomes available.

Exhibit J-2c. Project website content (continued).



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FREQUENTLY ASKED QUESTIONS AND ANSWERS

Purpose and Need

How much growth in demand for electricity is SRP expecting?

How much power will the CEP provide?

How does the Coolidge Expansion Project (CEP) enable the addition of more renewable energy?

Why can't SRP add batteries instead of natural gas turbines at Coolidge?

Is the Coolidge Expansion Project the lowest-cost resource option for SRP customers?

Community Impacts

What economic benefits will the project provide?

What does the plant look like and how will it impact the skyline?

Does SRP need to purchase any additional land for the CEP?

Environmental Impacts

How does this impact SRP's carbon goals?

How will this impact air quality and health?

How much water will the CEP use?

Project Details

What is the anticipated construction start date?

Did SRP conduct a competitive Request for Proposals (RFP) to identify options for the additional power generation needed?

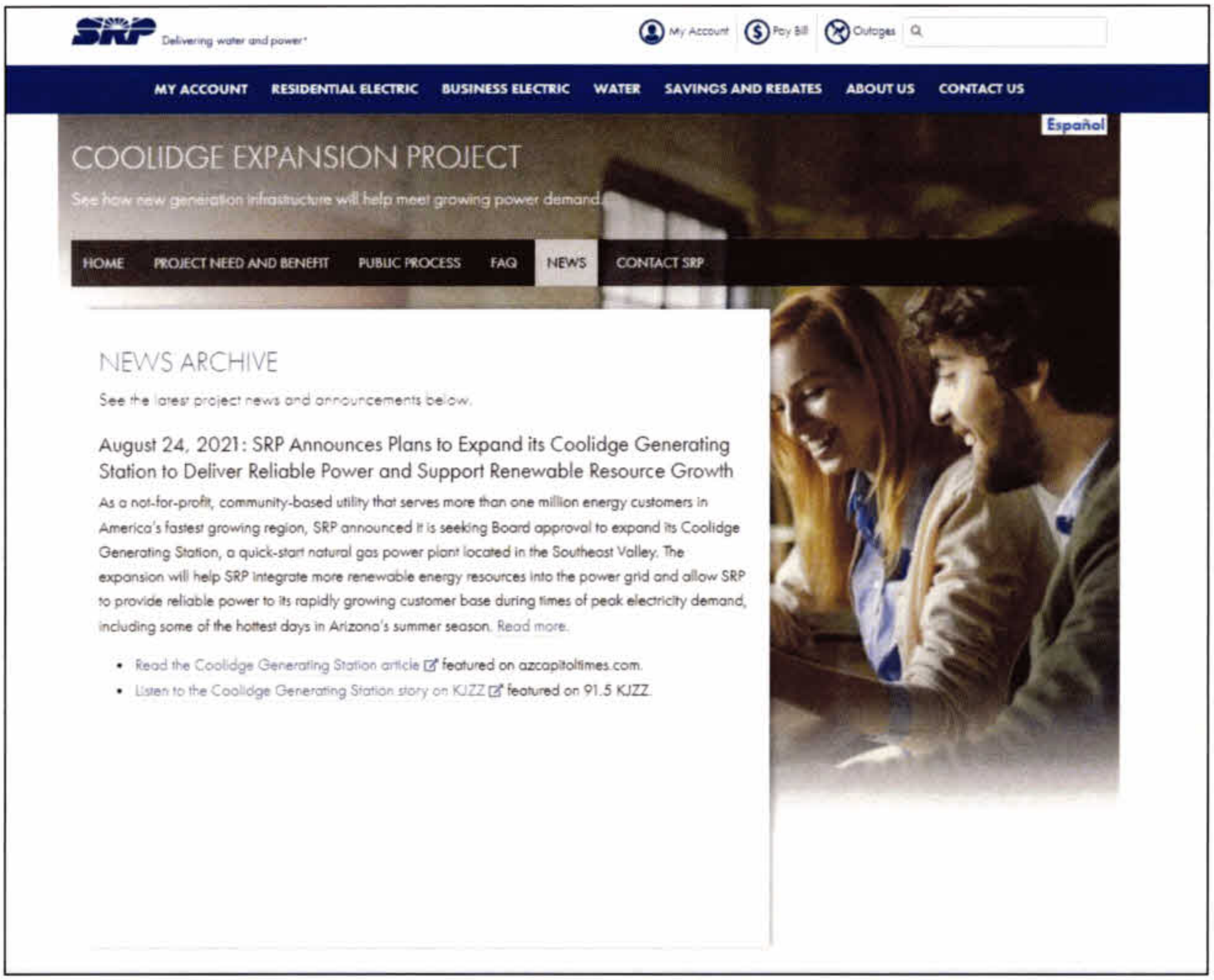
What factors did SRP consider when selecting the turbine technology?

Public Process

How will the public be involved in CEP?

What are the next steps for the project?

Exhibit J-2d. Project website content (continued).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Español

COOLIDGE EXPANSION PROJECT

See how new generation infrastructure will help meet growing power demand.

HOME | PROJECT NEED AND BENEFIT | PUBLIC PROCESS | FAQ | NEWS | CONTACT SRP

NEWS ARCHIVE

See the latest project news and announcements below.

August 24, 2021: SRP Announces Plans to Expand its Coolidge Generating Station to Deliver Reliable Power and Support Renewable Resource Growth

As a not-for-profit, community-based utility that serves more than one million energy customers in America's fastest growing region, SRP announced it is seeking Board approval to expand its Coolidge Generating Station, a quick-start natural gas power plant located in the Southeast Valley. The expansion will help SRP integrate more renewable energy resources into the power grid and allow SRP to provide reliable power to its rapidly growing customer base during times of peak electricity demand, including some of the hottest days in Arizona's summer season. Read more.

- Read the Coolidge Generating Station article featured on azcapitoltimes.com.
- Listen to the Coolidge Generating Station story on KJZZ featured on 91.5 KJZZ.

Exhibit J-2e. Project website content (continued).

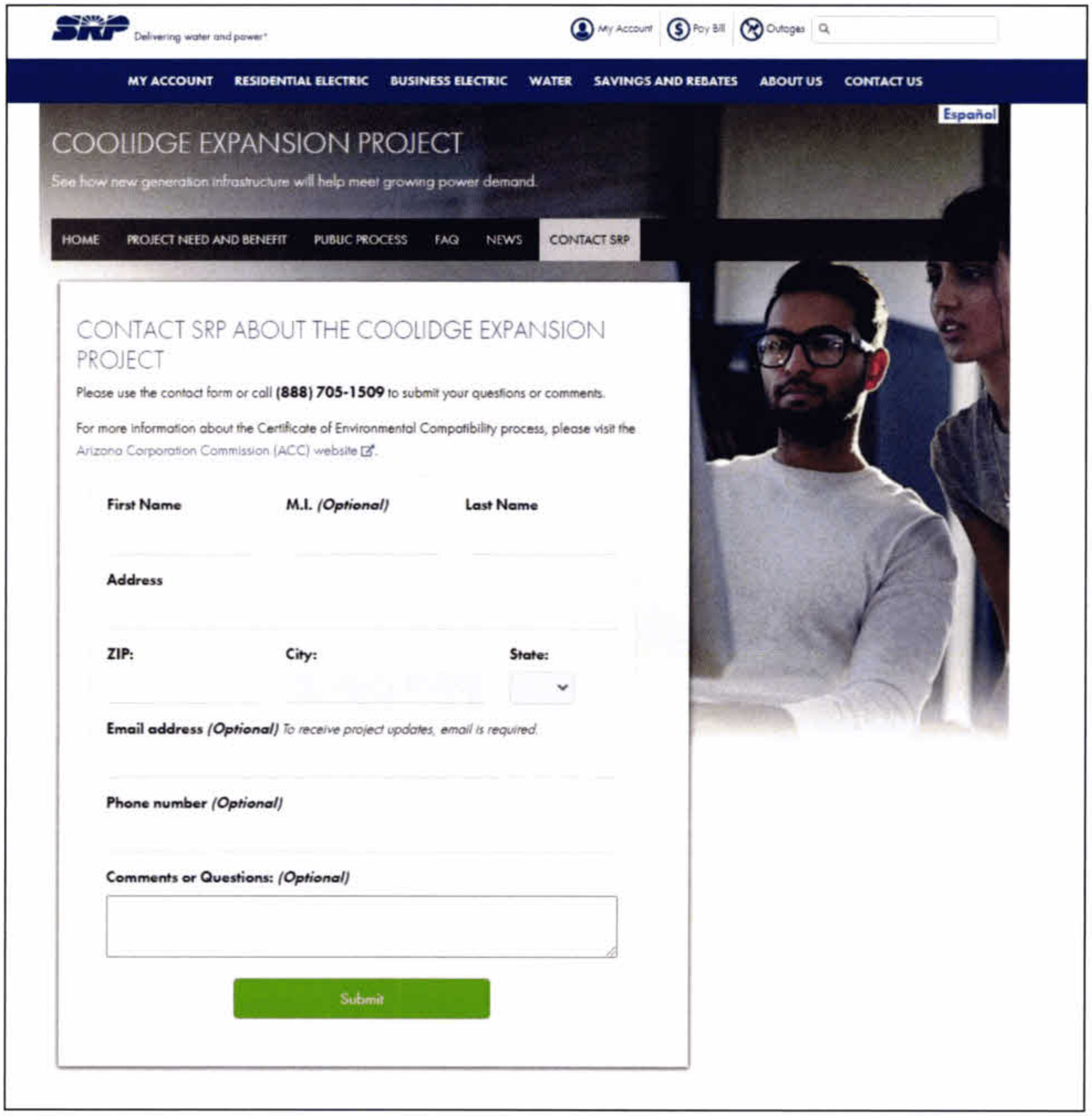
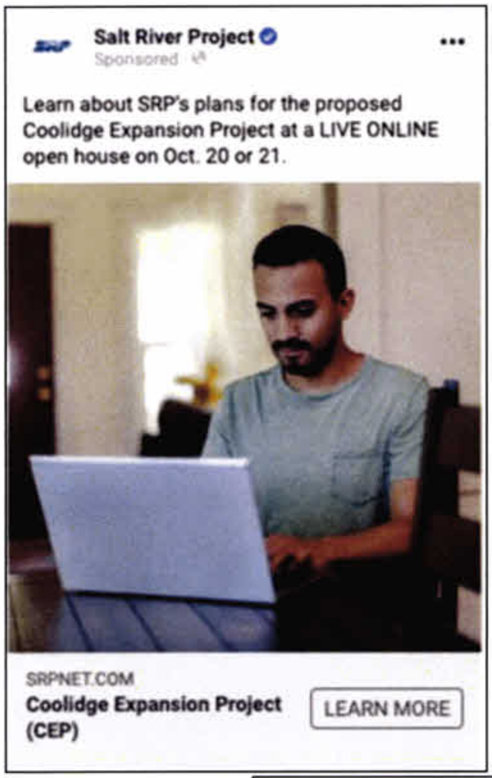
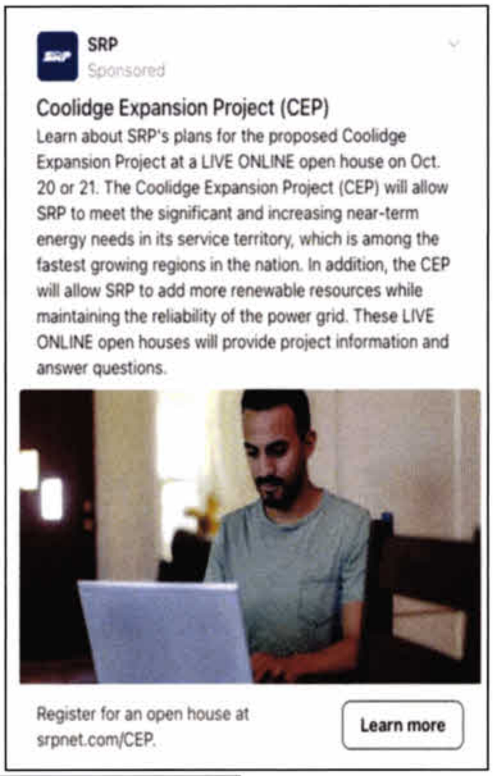


Exhibit J-2f. Project website content (continued).

Exhibit J-2g. Project website Spanish content example.

Exhibit J-3a. Facebook advertisements for the virtual open house.





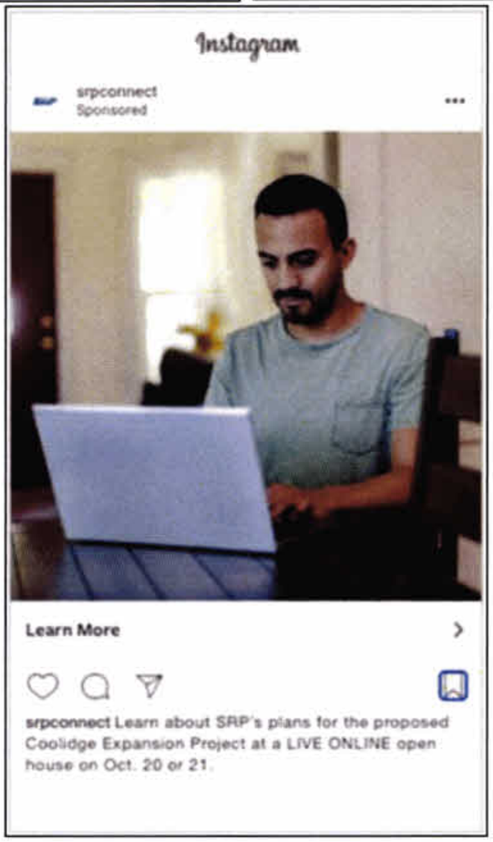
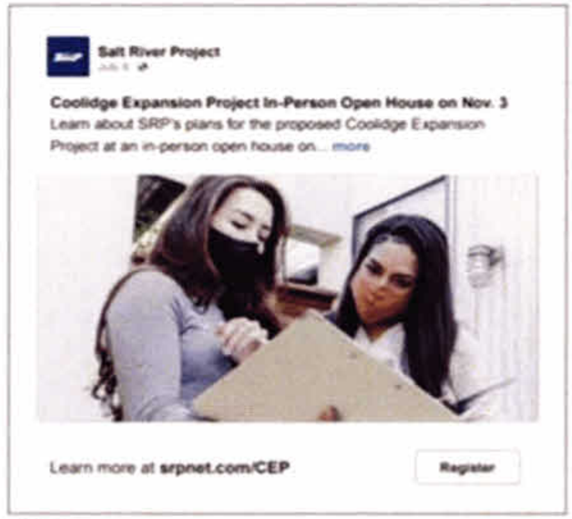


Exhibit J-3b. Social media advertisements for the live online open house events.

Nextdoor (English Only; Nextdoor does not support Spanish at this time)

EXPANDED



COMPACT

Facebook/Instagram English & Spanish

Exhibit J-3c. Social media advertisements for the in-person open house.

LIVE IN-PERSON OPEN HOUSE

Join us on Wednesday, Nov. 3, 2021, 4-6 p.m.*
Pinal County Fairgrounds
512 S. Eleven Mile Corner Road, Casa Grande, AZ 85194

Masks are required, no pre-registration needed.

ANNOUNCING THE COOLIDGE EXPANSION PROJECT

SRP is applying for a Certificate of Environmental Compatibility (CEC) for the expansion of the Coolidge Generating Station, a natural gas power plant near Coolidge, Arizona. The Coolidge Expansion Project (CEP) will allow SRP to meet the significant and increasing near-term energy needs in its service territory, which is among the fastest growing regions in the nation. In addition, the CEP will allow SRP to add more renewable resources while maintaining the reliability of the power grid.

To learn more about this project, visit **srpnet.com/CEP** or call **(888) 705-1509**. Para obtener información en español sobre este proyecto, visite **srpnet.com/CEPspanish**.

*Subject to change based on COVID-19 health and safety protocols.

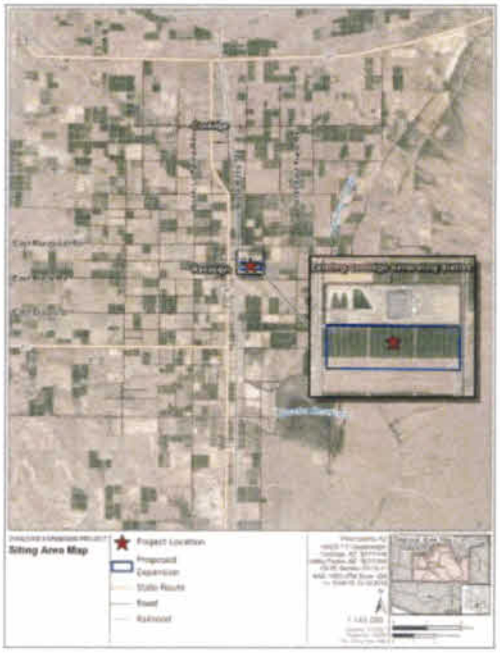


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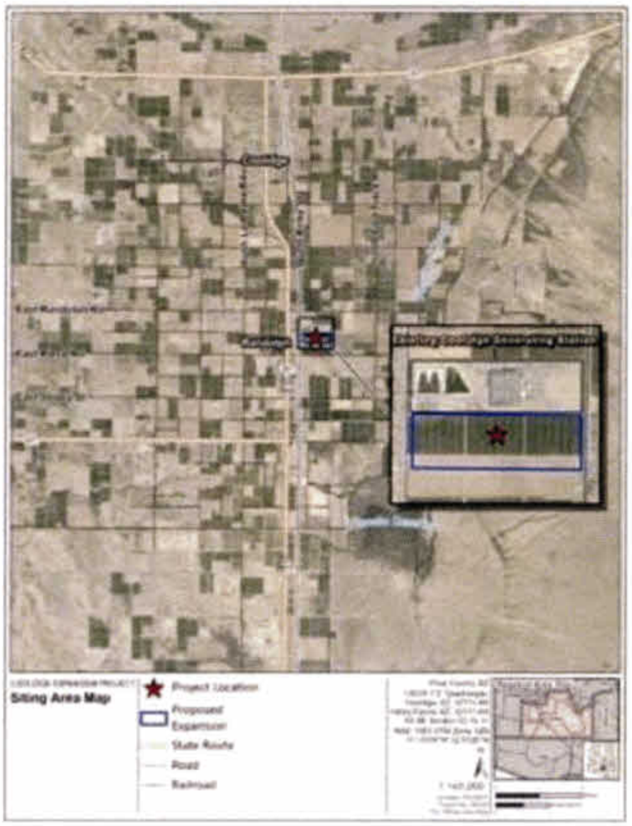
Exhibit J-4. Newspaper advertisements for the in-person open house.

LEARN ABOUT THE COOLIDGE EXPANSION PROJECT

WHY IS THIS PROJECT NEEDED?

The proposed Coolidge Expansion Project (CEP) is needed to meet the significant near-term increase in energy needs in SRP's service territory, which is among the fastest growing regions in the nation. In addition, the CEP will enable the addition of more renewable resources (such as solar and battery storage) while maintaining a reliable power grid. The CEP will ensure that SRP can meet these objectives while staying on the path to achieve our deep decarbonization goals over the long term.

PROPOSED EXPANSION SITE



WHAT BENEFIT DOES IT SERVE?

- **Meeting Near-term Demand:** One of SRP's primary responsibilities to the communities we serve is to provide reliable electric service. The CEP will allow SRP to fulfill this obligation in the face of strong economic growth in SRP's service territory.
- **Reliable Integration of Renewables:** SRP has committed to add 2,025 MW of solar energy to its renewable portfolio by 2025. Along with increased solar generation comes more variability in power output, especially during cloudy conditions. The CEP includes quick starting (10 minutes) and fast ramping power generation resources that can smooth out these fluctuations and ensure SRP delivers consistent, reliable power.
- **Importance of Location:** The CEP location allows SRP to leverage the existing Coolidge Generating Station site and infrastructure while also ensuring a better balance of power generation located in the East Valley with power generation located in the West Valley. This will help to optimize the overall power transfer capability, reliability and flexibility of SRP's transmission system.

OPEN HOUSE SCHEDULE

Live online
Wednesday, Oct. 20, 2021
Noon-1 p.m. or 5:30-6:30 p.m.
Register at srpnet.com/CEP or **(888) 705-1509**

Thursday, Oct. 21, 2021
Noon-1 p.m. or 5:30-6:30 p.m.
Register at srpnet.com/CEP or **(888) 705-1509**

In person
Wednesday, Nov. 3, 2021
4-6 p.m.
Pinal County Fairgrounds
No registration needed

EXISTING COOLIDGE GENERATING STATION

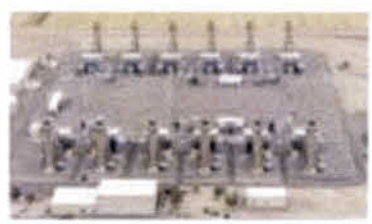


Exhibit J-5. Randolph community event handout.

Coolidge Expansion Project

Live Online Open House

October 2021

Delivering water and power®

SRP serves our customers and communities by providing sustainable, reliable and affordable water and energy.

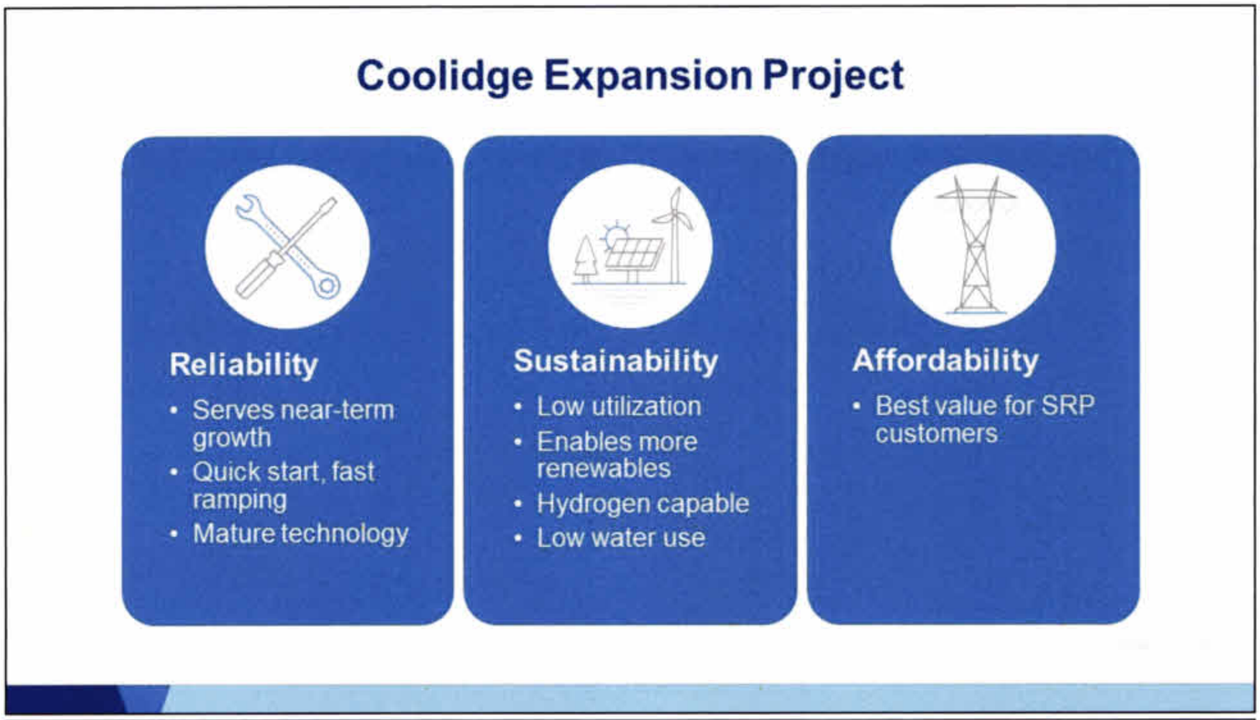
Exhibit J-6. Live online open house presentation.

Coolidge Expansion Project Location

Strong Economic Growth Ahead

- **Arizona has the #1 fastest growing county in the U.S.**
- The **Southwest** is becoming America's advanced manufacturing hub
- **Housing permits are at the highest since mid-2000's**: Over 100 every day

Exhibit J-6. Live online open house presentation (continued).



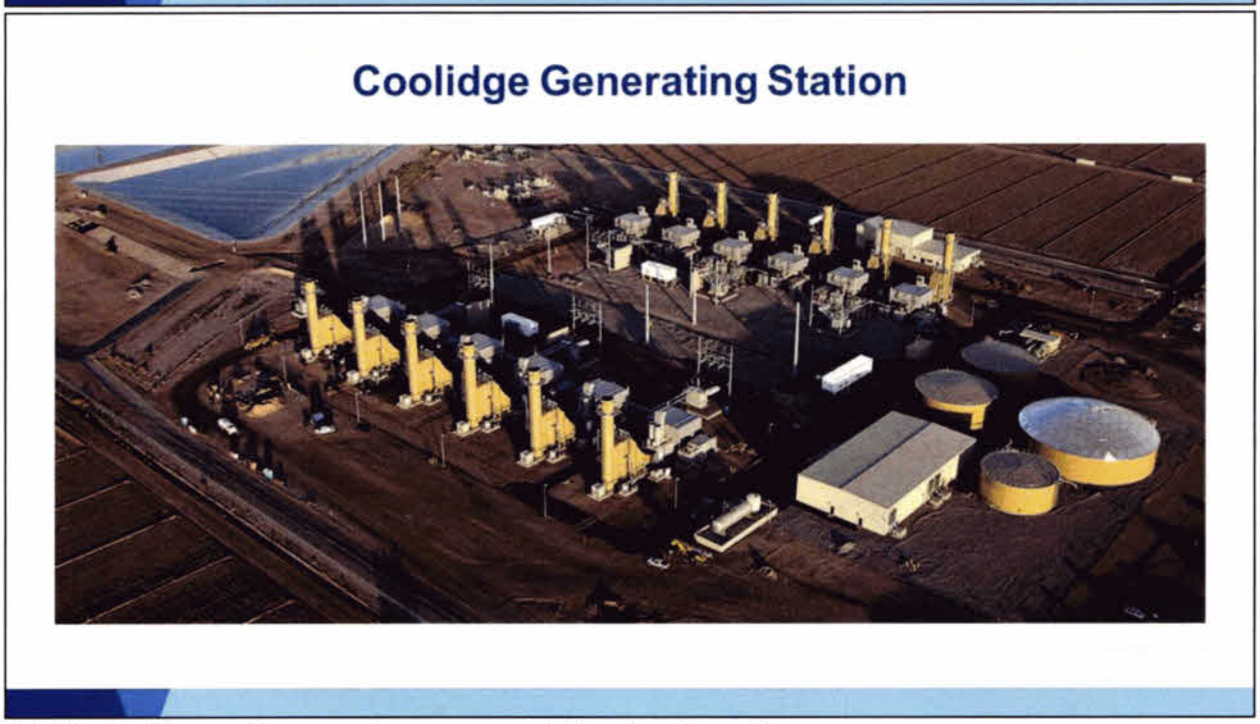
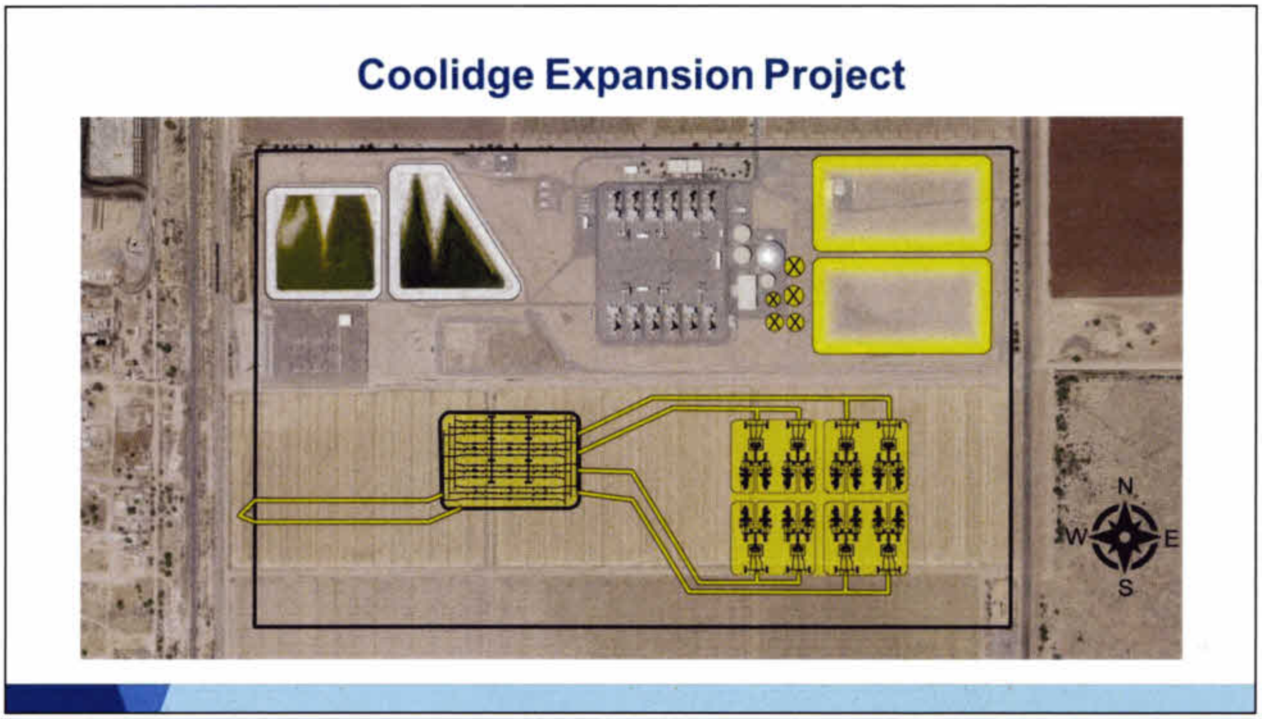


Exhibit J-6. Live online open house presentation (continued).



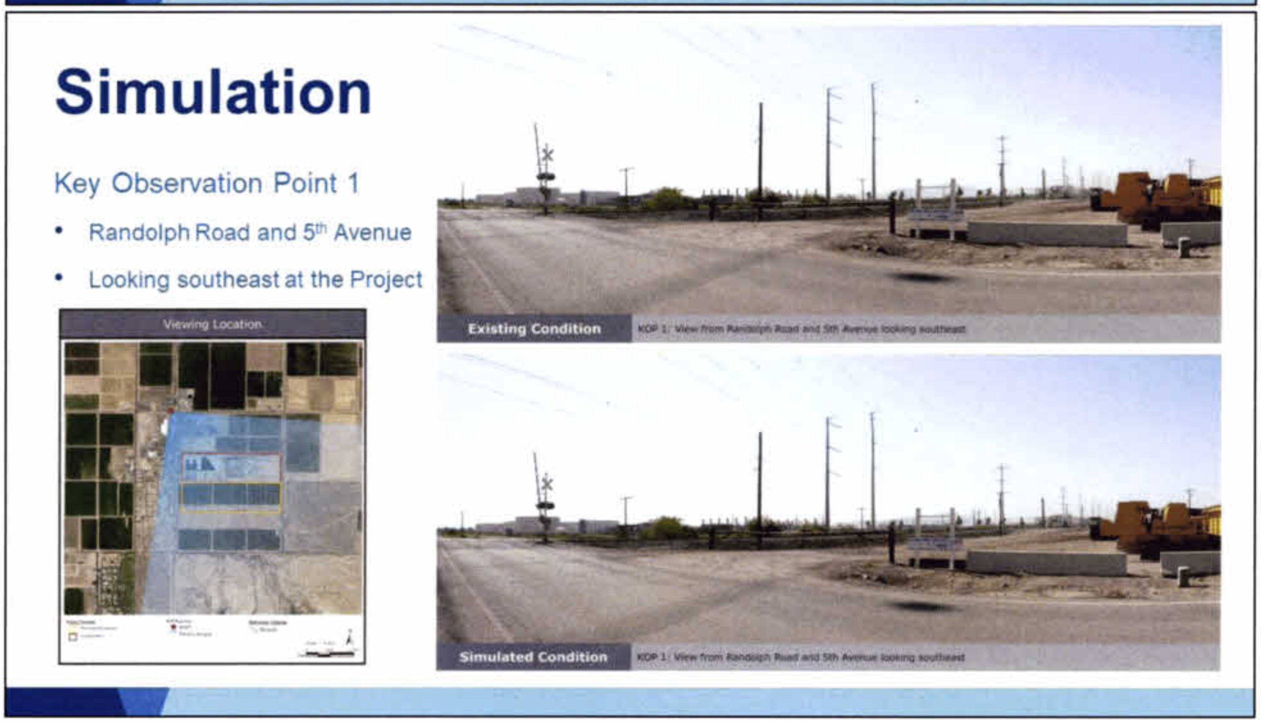
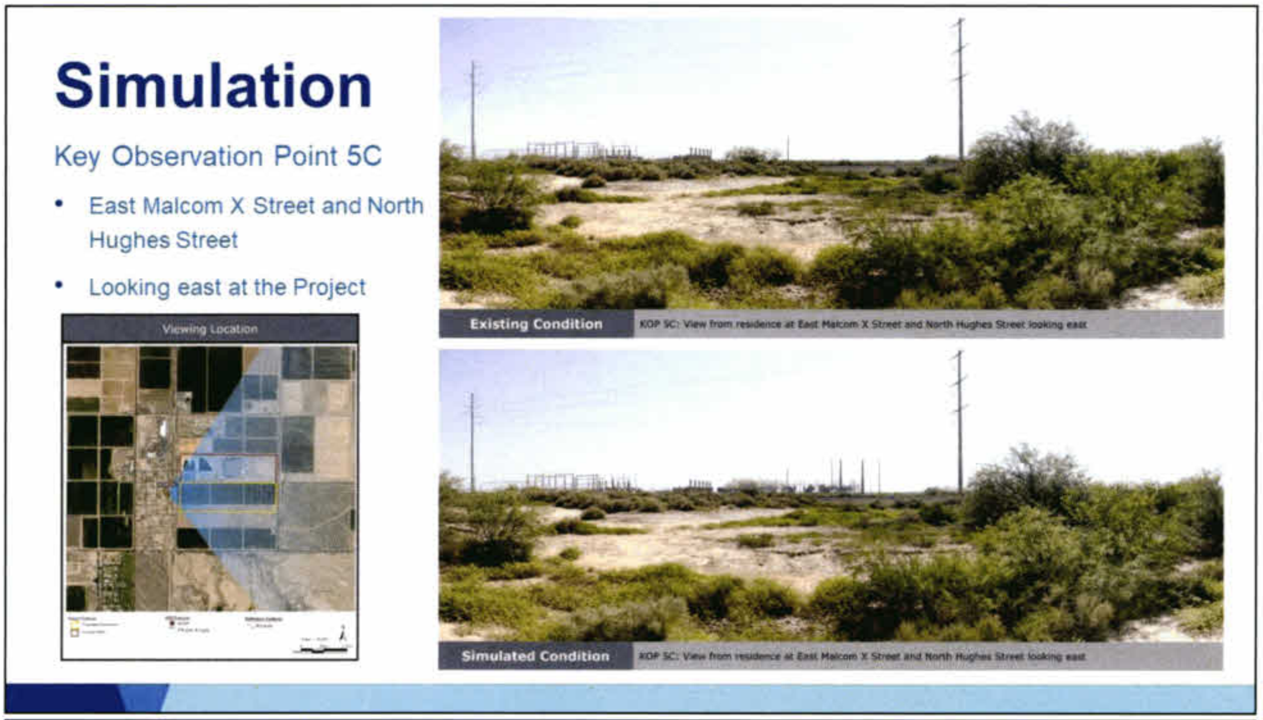


Exhibit J-6. Live online open house presentation (continued).



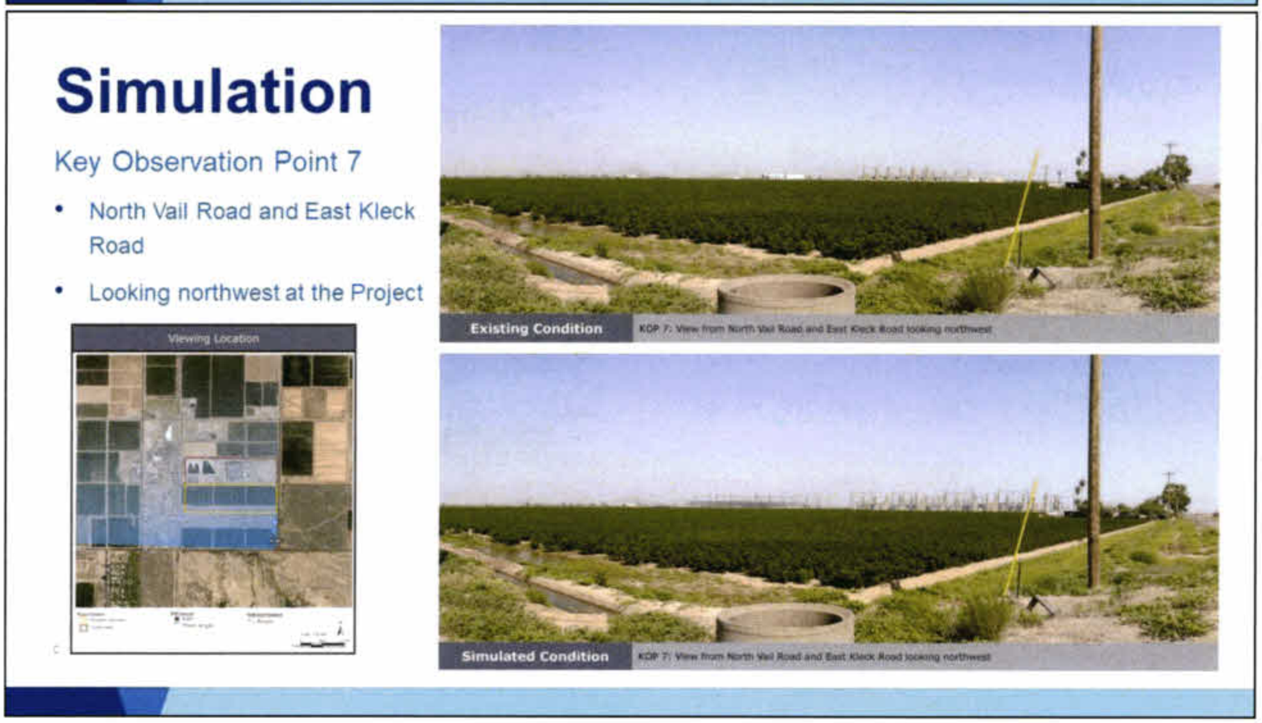
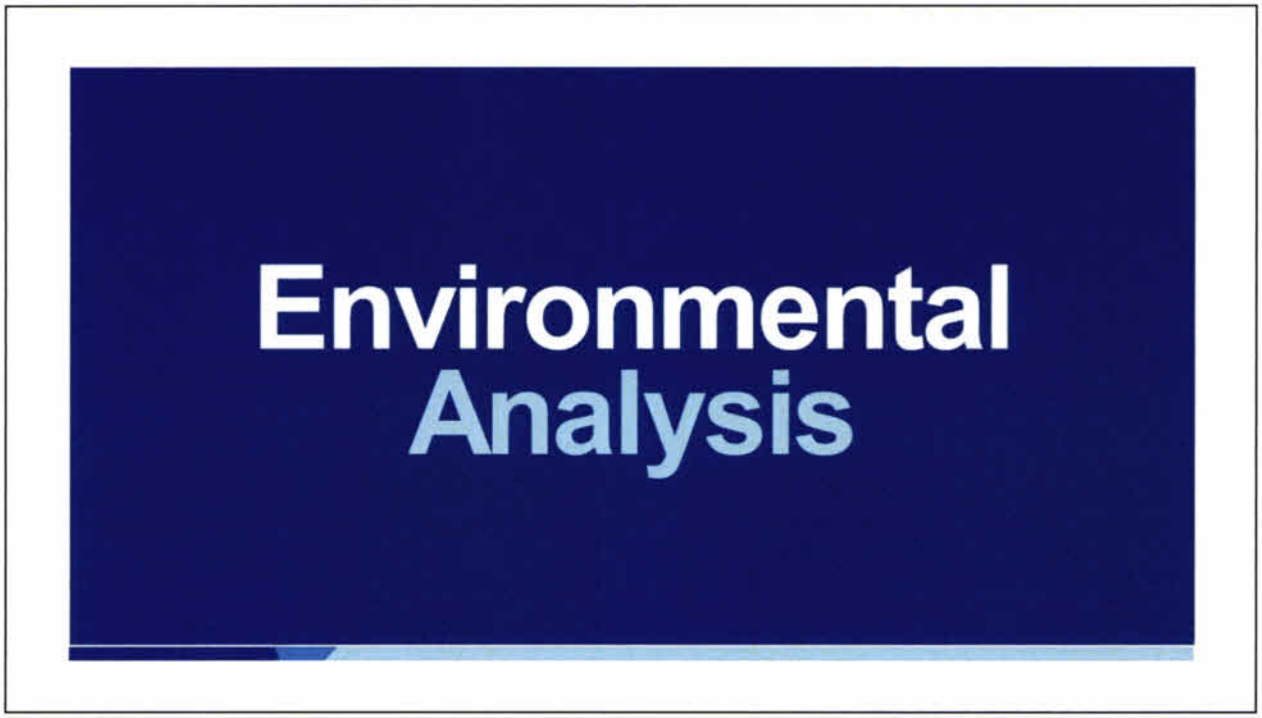


Exhibit J-6. Live online open house presentation (continued).



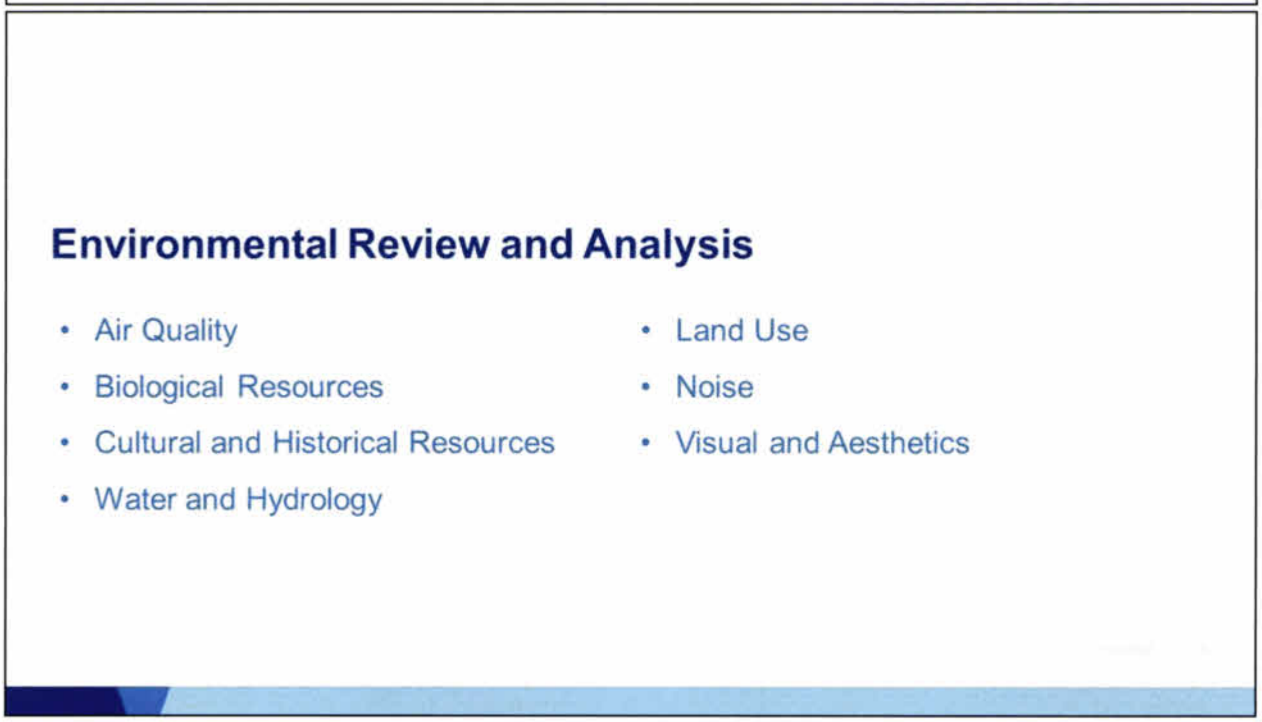
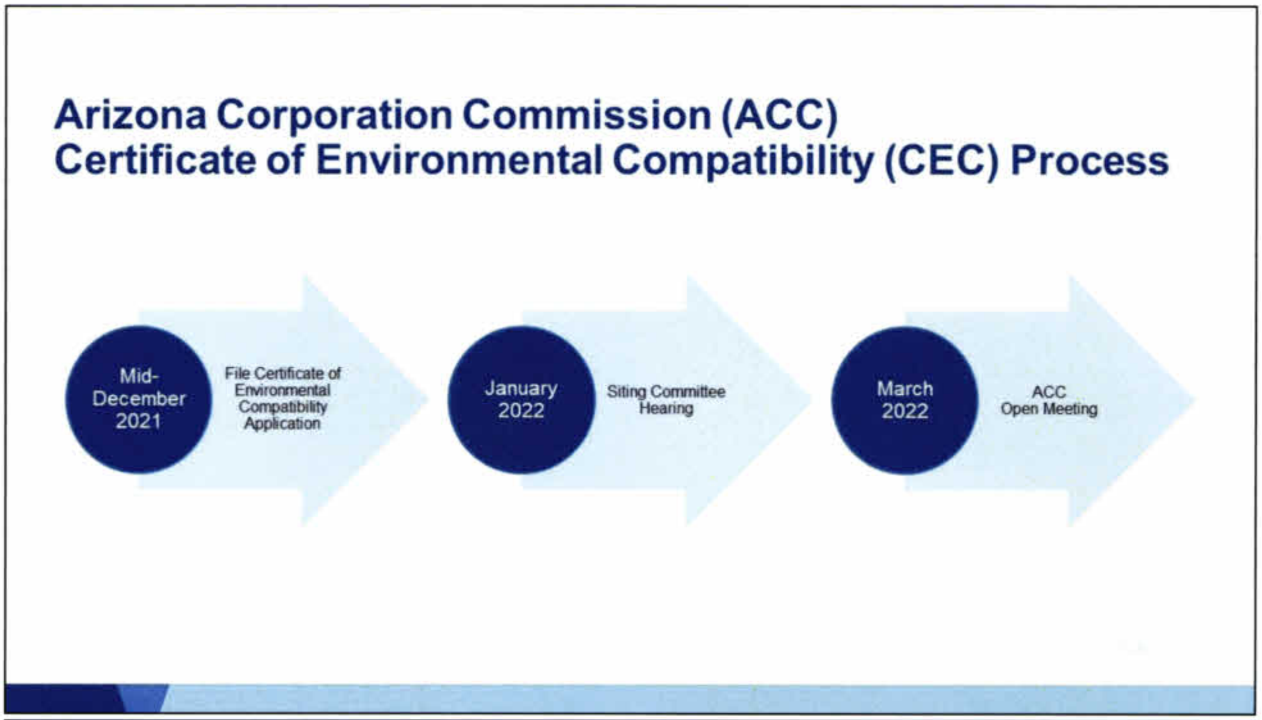


Exhibit J-6. Live online open house presentation (continued).



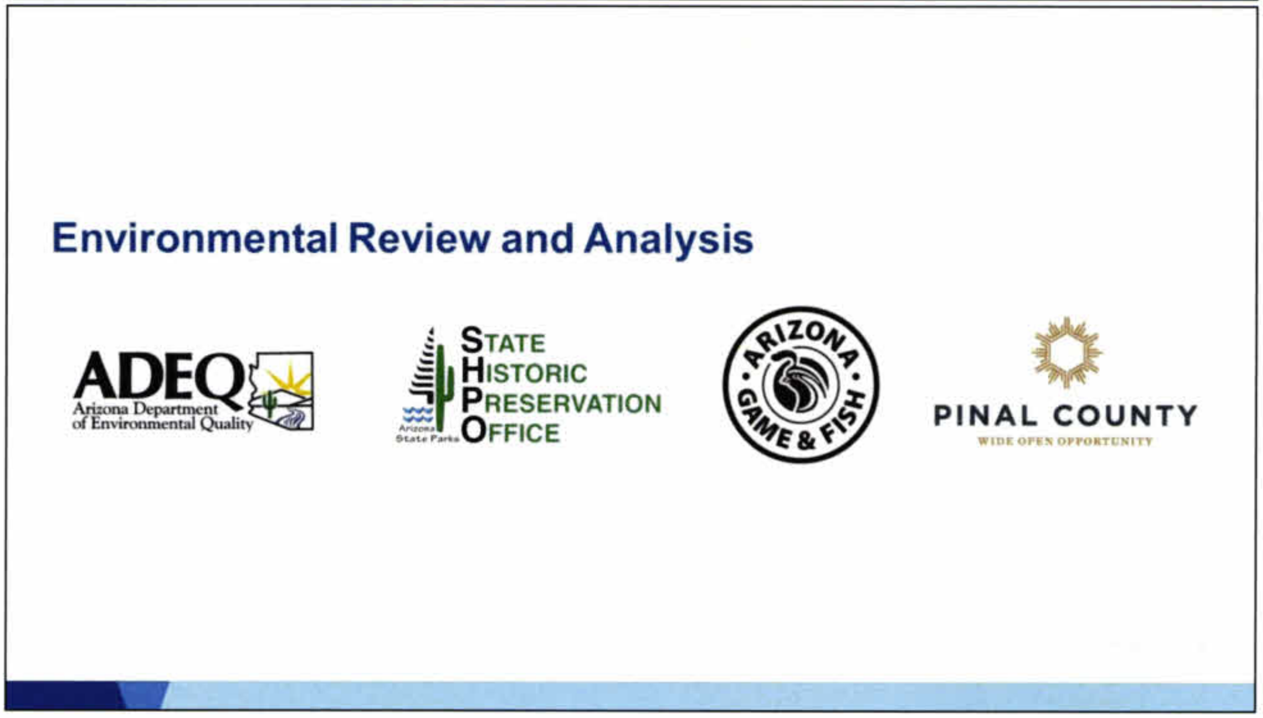


Exhibit J-6. Live online open house presentation (continued).

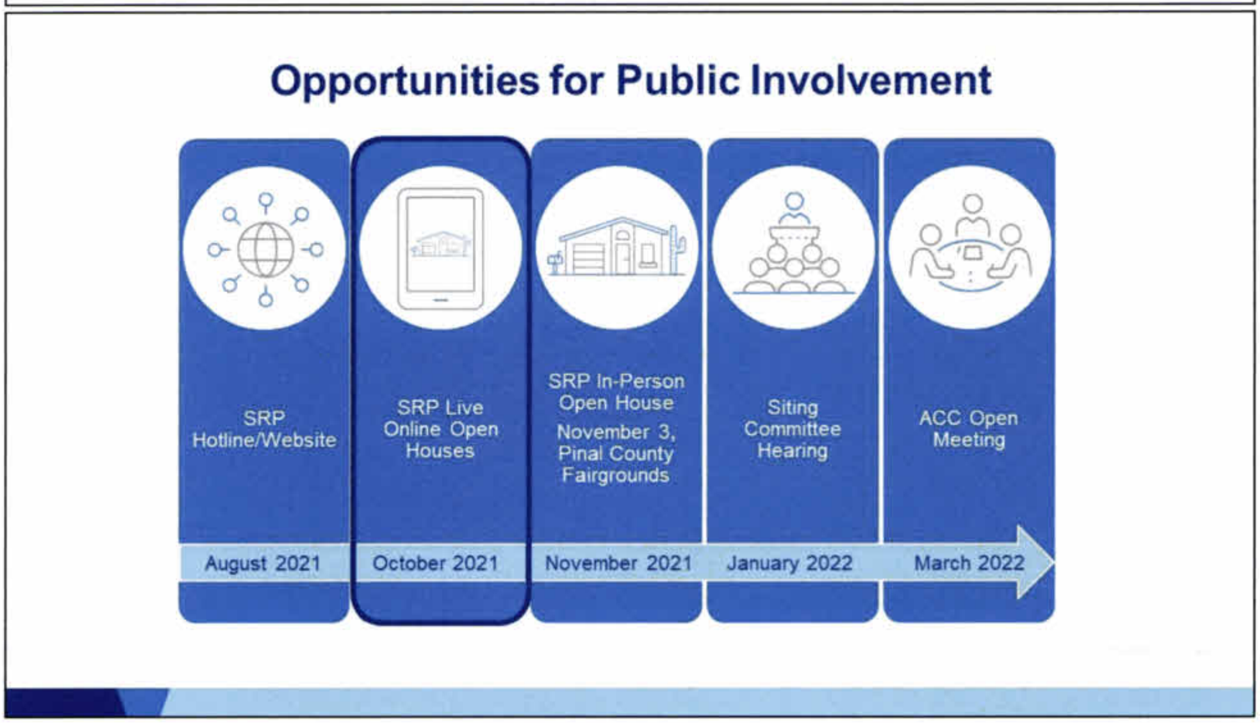


Exhibit J-6. Live online open house presentation (continued).

Learn More

srpnet.com/cep | (888) 705-1509
azcc.gov/arizona-power-plant/line-siting-committee

thank you!

Exhibit J-6. Live online open house presentation (continued).

Welcome!
Coolidge Expansion Project

Pinal County Fairgrounds, Coolidge, AZ
November 2021

Delivering water and power®

SRP serves our customers and communities by providing sustainable, reliable and affordable water and energy.

Exhibit J-7a. In-person open house posters.

Station 1
Project Description

Existing Coolidge Generating Station

Built: 2009–2011 **Purchased by SRP:** 2019

Exhibit J-7a. In-person open house posters (continued).

Coolidge Expansion Project Location

- Coolidge Generating Station is an existing natural gas power plant located 5 miles south of the center of Coolidge.
- The location of the proposed Coolidge Expansion Project (▭/ ★) was included in SRP's 2019 purchase.

Station 2
Project Need & Benefit

Exhibit J-7a. In-person open house posters (continued).

Coolidge Expansion Project

Reliability
- Serves near-term growth
- Quick starting, fast ramping
- Mature technology

Sustainability
- Low utilization
- Enables more renewables
- Hydrogen-capable
- Low water use

Affordability
- Best value for SRP customers

Strong Economic Growth Ahead

- **Arizona has the #1 fastest growing county in the U.S.**
- The **Southwest** is becoming America's advanced manufacturing hub
- **Housing permits at their highest since the mid-2000s**: over 100 every day

Coolidge Expansion Project

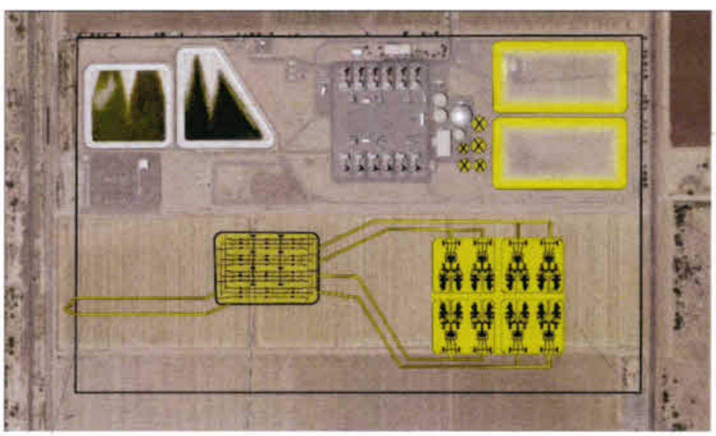


Exhibit J-7a. In-person open house posters (continued).

Station 3
Project Simulations

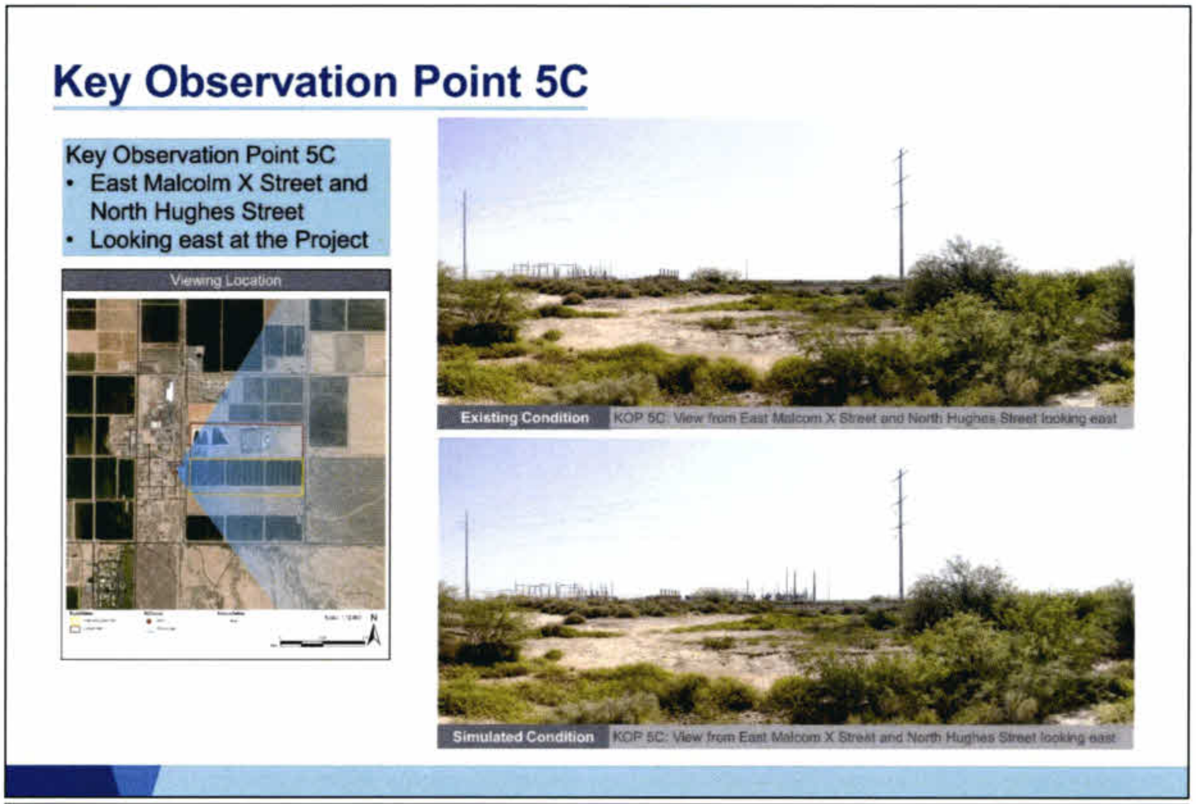
Key Observation Point 1

Key Observation Point 1
- Randolph Road and 5th Avenue
- Looking southeast at the Project

Existing Condition KOP 1: View from Randolph Road and 5th Avenue looking southeast

Simulated Condition KOP 1: View from Randolph Road and 5th Avenue looking southeast

Exhibit J-7a. In-person open house posters (continued).



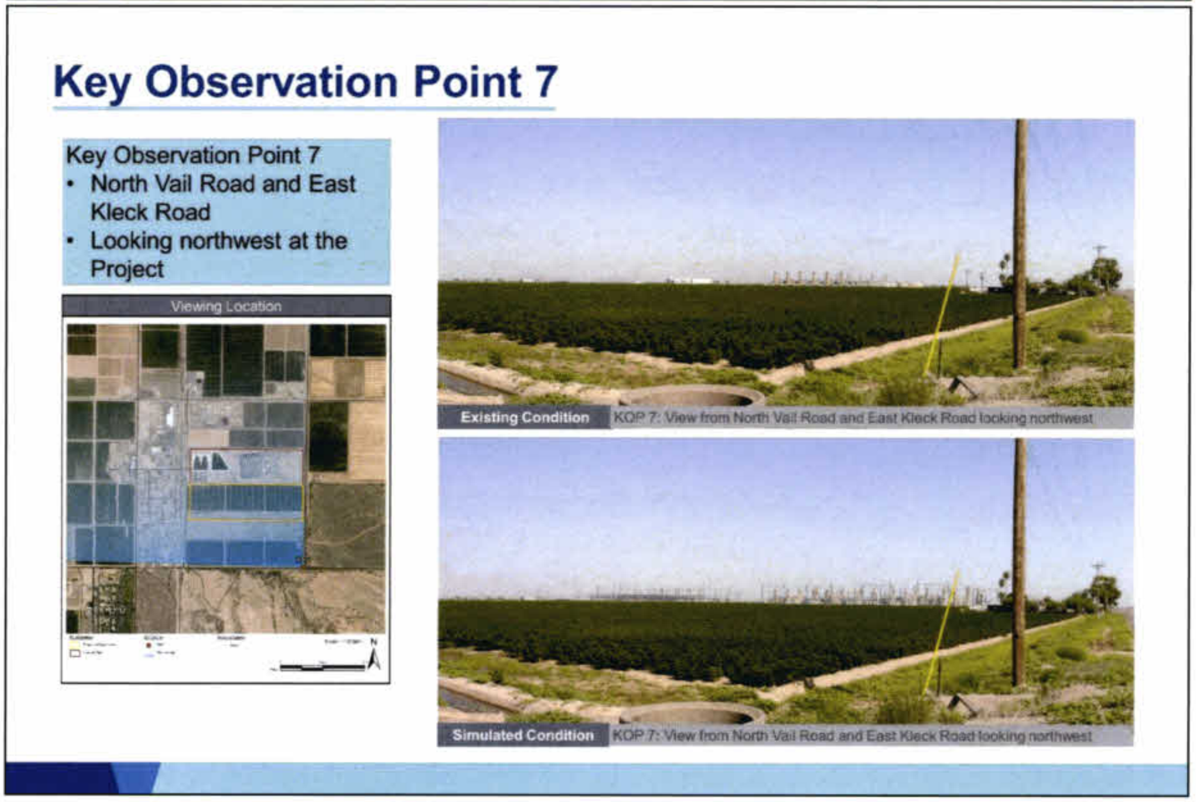
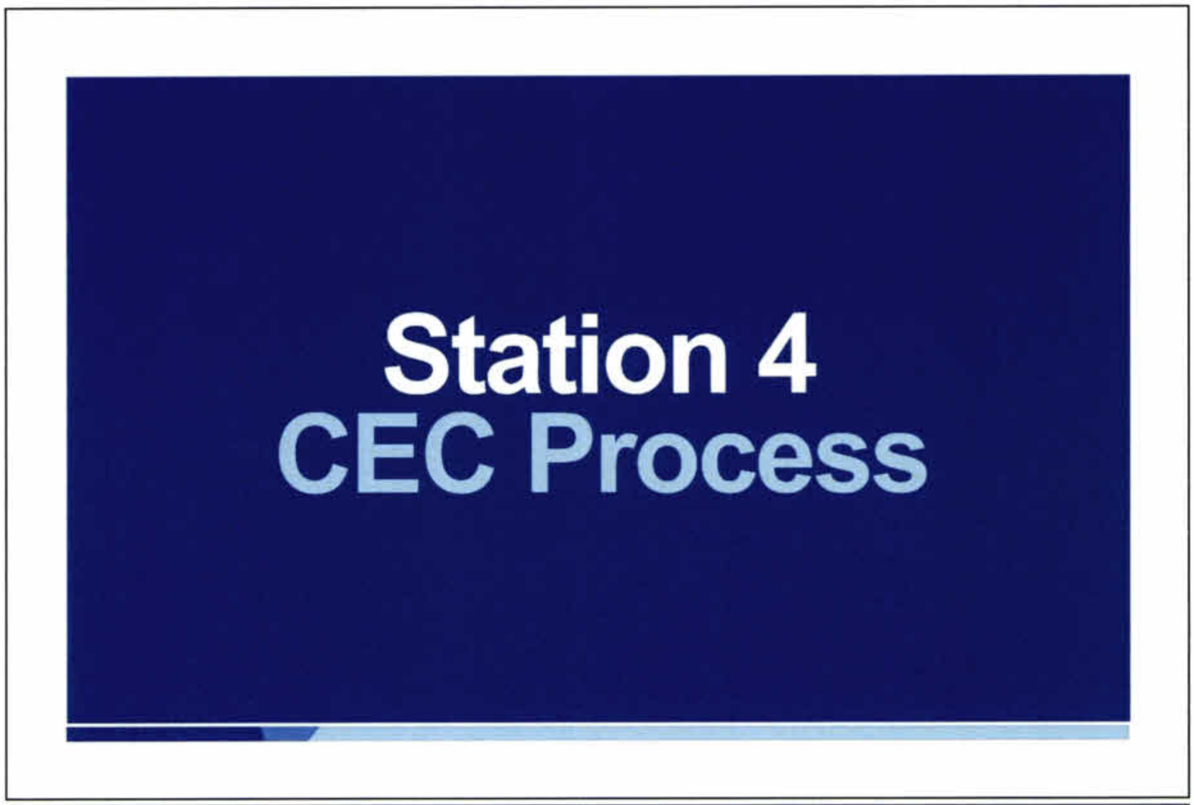


Exhibit J-7a. In-person open house posters (continued).



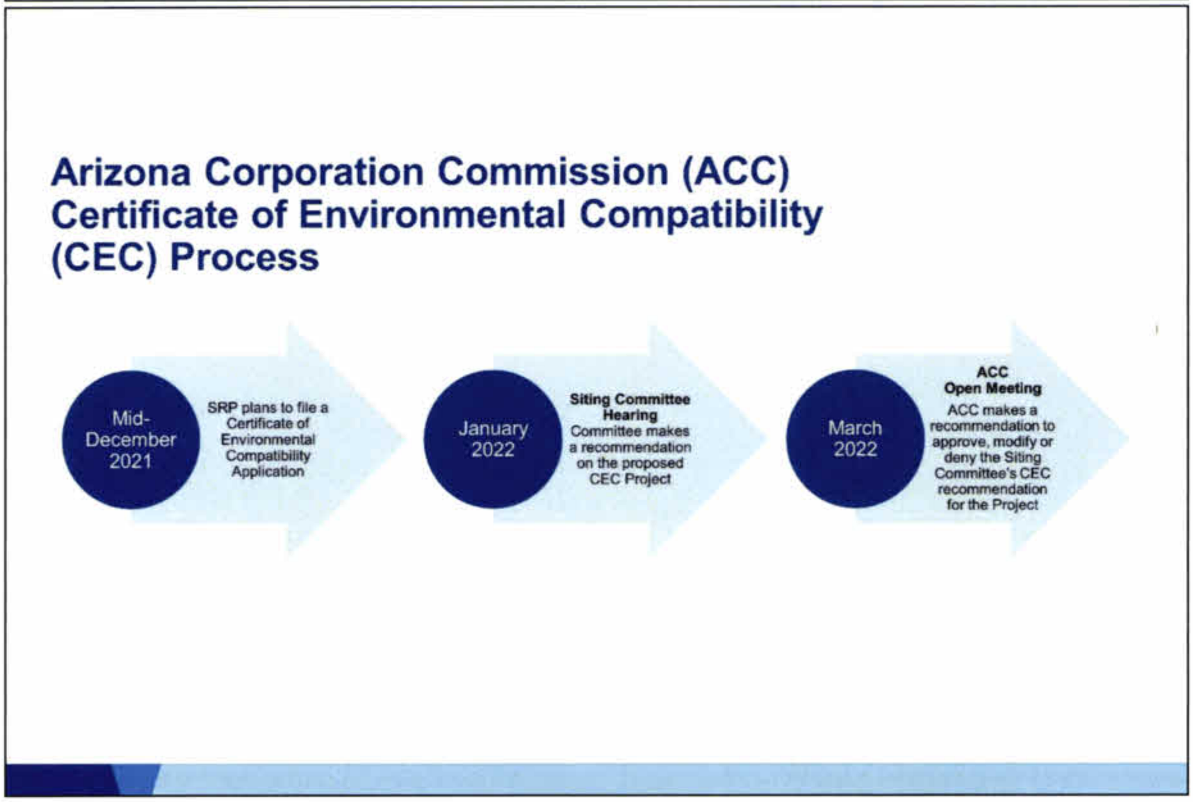


Exhibit J-7a. In-person open house posters (continued).

Environmental Review and Analysis

- Air Quality
- Biological Resources
- Cultural and Historical Resources
- Water and Hydrology
- Land Use
- Noise
- Visual and Aesthetics

Cooperating agencies include:

ADEQ Arizona Department of Environmental Quality

State Historic Preservation Office

Arizona Game & Fish

PINAL COUNTY
WIDE OPEN OPPORTUNITY

Station 5
Public Comment

Exhibit J-7a. In-person open house posters (continued).

Opportunities for Public Involvement

Learn More & Comment

srpnet.com/CEP | (888) 705-1509
azcc.gov/arizona-power-plant/line-siting-committee

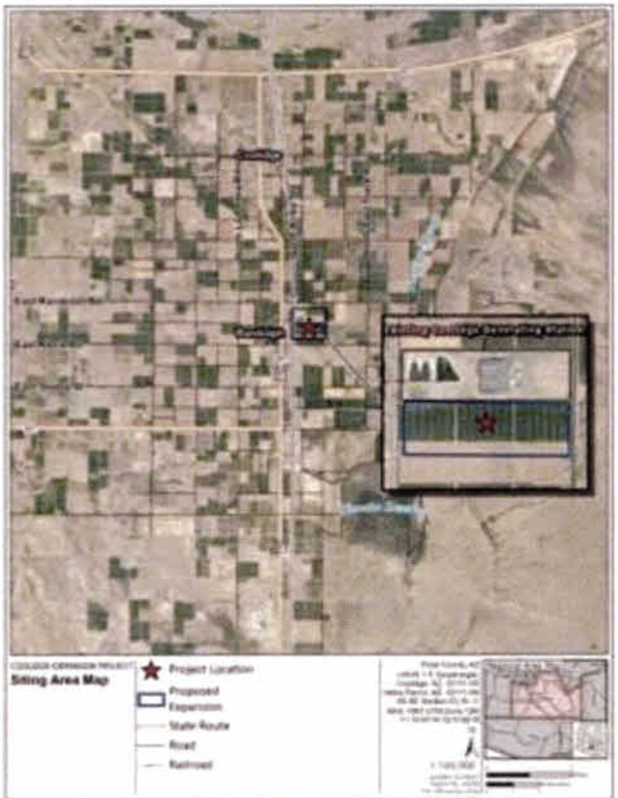
Exhibit J-7a. In-person open house posters

LEARN ABOUT THE COOLIDGE EXPANSION PROJECT

WHY IS THIS PROJECT NEEDED?

The proposed Coolidge Expansion Project (CEP) is needed to meet the significant near-term increase in energy needs in SRP's service territory, which is among the fastest growing regions in the nation. In addition, the CEP will enable the addition of more renewable resources (such as solar and battery storage) while maintaining a reliable power grid. The CEP will ensure that SRP can meet these objectives while staying on the path to achieve our deep decarbonization goals over the long term.

PROPOSED EXPANSION SITE



WHAT BENEFIT DOES IT SERVE?

- **Meeting Near-term Demand:** One of SRP's primary responsibilities to the communities we serve is to provide reliable electric service. The CEP will allow SRP to fulfill this obligation in the face of strong economic growth in SRP's service territory.
- **Reliable Integration of Renewables:** SRP has committed to add 2,025 MW of solar energy to its renewables portfolio by 2025. Along with increased solar generation comes more variability in power output, especially during cloudy conditions. The CEP includes quick starting (10 minutes) and fast ramping power generation resources that can smooth out these fluctuations and ensure SRP delivers consistent, reliable power.
- **Importance of Location:** The CEP location allows SRP to leverage the existing Coolidge Generating Station site and infrastructure while also ensuring a better balance of power generation located in the East Valley with power generation located in the West Valley. This will help to optimize the overall power transfer capability, reliability and flexibility of SRP's transmission system.

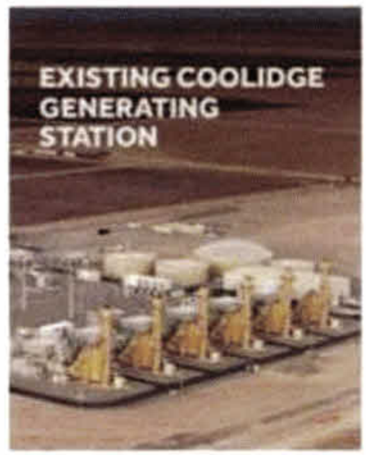


Exhibit J-7b. In-person open house handout

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